USG® Gypsum Plasters

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1857

A.I.A. File No. 21-A

description and utility

Four types of United States Gypsum plastering products are covered in this catalog: (1) Basecoat Plasters, (2) Finish Coat, Gauging and Ornamental Plasters and Finishing Limes, (3) Acoustical Plasters, (4) Special Plasters.

Functions, properties and limitations are treated within each group. A general plastering specification appears on pages 6 to 8.

For the beauty and durability of which plaster is capable, rigid requirements should be followed as to number of coats applied. Three-coat work is mandatory on all metal lath, and on edge-supported gypsum lath used in ceilings; three-coat work is desirable on all gypsum lath; two-coat work is acceptable on unperforated gypsum lath when properly supported, and masonry plaster bases. Exceptions are noted below for IMPERIAL* Plasters.

In the preparation of plastering specifications, consideration should be given to the selection of materials not only for compatability, but for the *quality* of the structure to be plastered. Since ASA and AIA specifications are based on minimum standards, they should be followed only in applications where minimum plastering quality is desired. It is wise to upgrade plastering specifications wherever possible; all the elements are available for quality installations. Following are general recommendations listed in the order of preference—No. 1 in each case can be expected to produce the highest quality results:

Basecoat Plaster (over metal lath)

Scratch Coat	Brown Coat
1. STRUCTO-BASE*(1) Plaster, sanded 100:2	STRUCTO-BASE Plaster, sanded 100:3
2. Wood Fiber, neat, or sanded up to 100:1	Wood Fiber, sanded up to 100:1
3. Wood Fiber, neat, or sanded up to 100:1	RED TOP* Gypsum Plaster, sanded 100:2
4. Wood Fiber, neat, or sanded up to 100:1	STRUCTO-LITE* Plaster (sand float finish only)
5. RED TOP Gypsum Plaster, sanded 100:2	RED TOP Gypsum Plaster, sanded 100:3
6. RED TOP Gypsum Plaster, perlited 100:2	RED TOP Gypsum Plaster, perlited 100:2 (sand float finish only)

(1) Verify availability with your local U.S.G. Sales representative.

Basecoat Plaster (over gypsum lath)

See "Use of Aggregates" table, Page 3.

Aggregates

1. Sand
2. Mill-mixed Perlite
3. Job-mixed Perlite
4. Job-mixed Vermiculite

Note: Lightweight aggregates should not be used on a construction where sound isolation is a consideration.

Finish Coats

Float Finishes

1. ORIENTAL* Interior
2. IVORY Lime (92% hydrate), Keenes Cement and white silica sand
3. GRAND PRIZE or RED TOP Lime, RED TOP Gauging and white silica sand

Smooth Trowel Finishes

1. IVORY Lime, and STRUCTO-GAUGE* Plaster
2. DIAMOND* Finish Plaster
3. IVORY Lime, RED TOP Gauging, with ½ cu. ft. of perlite fines or fine silica sand
4. IVORY Lime, and Keenes Cement
5. GRAND PRIZE or RED TOP Lime, and RED TOP Gauging Plaster

Note: Float Finishes 1, 2 and Trowel Finish 3 (except over metal lath) are the only finishes recommended for use over a basecoat containing lightweight aggregate. Finishes 1, 2 and 4 (smooth trowel) provide high abrasion resistance and because of their hardness must be used over a comparably hard basecoat.

types and functions

1. Basecoat Plasters

description

The base of all gypsum plasters is gypsum rock, hydrous calcium sulfate, which has a water content of about 20% in chemical combination. In its manufacture, about ¾ of this chemically combined water is removed from the gypsum rock by means of a controlled calcination procedure. Then as water is added at the job, the material crystallizes (sets), reverting to its original chemical composition.

RED TOP Gypsum Plasters are specifically formulated to control setting time and other important characteristics. This depends upon the intended use and method of application, the climatic conditions of the area, and job conditions.

USG Basecoat Plasters can be applied by using either hand or machine methods, on gypsum or metal lath; gypsum or clay tile; concrete or cinder blocks; brick, or other approved plaster bases.

function

Basecoat plasters provide a plastic working material which will conform to most designs and provide the ultimate in durable walls and ceilings.

Fire Protection—Gypsum plaster, properly proportioned with approved aggregates, and used in conjunction with specific plaster bases, provides excellent fire protection (see specific USG Systems Folders for fire test data).

Strength—There are significant differences in the strengths of gypsum basecoat plasters (see technical data page 3). The strength of a gypsum basecoat plaster is dependent on four factors:

1. *Water-Plaster Ratio*—The water required to produce a plastic mix depends on the amount and type of aggregate.
2. *Control of Set*—RED TOP Gypsum Plasters are formulated for use with market aggregates, climatic conditions, and job conditions. The quicker a gypsum plaster sets, the stronger the basecoat.
3. *Time of Application*—Plasters should be applied within one hour after mixing to assure desired strength and proper bond.
4. *Ventilation and Drying* are important adjuncts to producing a strong basecoat once the gypsum plaster has set. Not only must the plaster be dried, but the moisture must be removed from the building.

A.I.A. File No. 21-A

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Sound Isolation—Gypsum plaster in combination with lathing or various construction systems offers sound transmission loss characteristics suitable for most requirements. Sanded basecoat plasters provide the optimum results (see USG Construction Selector).

limitations

1. STRUCTO-BASE, or RED TOP Gypsum Plaster, must have aggregate added strictly according to specifications. Use of too much aggregate drastically decreases its strength.

2. Machine application of wood fiber plaster requires the addition of up to 1 cu. ft. of sand per 100 lbs. of plaster.

3. Where sound transmission is the prime consideration in partition or ceiling assemblies, use sand aggregate only, since mass is a controlling factor.

4. Over interior monolithic concrete ceilings, walls, beams, columns or soffits, a high quality plaster bonding agent, followed by application of RED TOP Concrete Finish or other basecoat plasters or finish coats, is recommended.

5. Gypsum plasters should not be used where they will come in contact with water or excessive moisture.

Gypsum plasters may be applied to ceilings of open porches, carports, soffits of eaves, walkways, and canopies, but only when these surfaces are horizontal or inclined downward from the structure. All such plaster surfaces should be protected from direct exposure to rain and moisture, and suitable drips and casings provided along edges. Refer to Gypsum Assn. AIA File 21-A-2, Gypsum Plaster in Exterior Locations.

6. Plaster application on masonry or concrete walls, or ceilings that have been coated with bituminous compounds or other waterproofing agents, is not recommended.

Because of the possibility of condensation or water seepage, plastering to interior side of exterior masonry walls above grade or exterior foundation walls below grade is not recommended. In each instance they should be furred and lathed before plastering (see USG Construction Selector). Subgrade construction should also be waterproofed on the exterior side.

7. The only plaster product recommended for the embedment and finishing of electric heat cables is RED TOP Radiant Heat Plaster backed by RED TOP Radiant Heat Plaster Base. See page 5 here, and USG Folder b-1517.

8. Basecoat plasters must not die or stop against a hollow metal door frame return. Provision must be made to dampen the trim return vibration by grouting, and by the use of special anchors. The grout should be raked out to allow lath and plaster to be inserted into the frame.

RED TOP Wood Fiber Plaster is a gypsum plaster containing fine particles of selected wood fiber. It normally requires the addition of water only; however, when used over masonry plaster bases, 1 cu. ft. of sand per 100 lbs. of plaster must be added, and when used as a brown coat 1 cu. ft. of sand may be added. Wood fiber plaster can be applied to all standard lath and masonry plaster bases; it is strongly recommended as a scratch coat for metal lath.

Wood fiber weighs approximately ¼ less than a sanded gypsum basecoat; has nearly twice the compressive and tensile strength of sanded plaster; is an excellent fire-protective material, generally providing greater fire resistance than sanded gypsum plaster; costs slightly more than sanded gypsum plaster. Complies with ASTM Spec. C-28 and Federal Specification No. SS-P-402 Type W.

RED TOP Gypsum Plaster is a gypsum basecoat requiring the addition of aggregate. It is supplied as either Fibered (recommended for scratch coat on metal lath) or Unfibered in three formulations: *Regular*—for use with sand aggregate, hand application; *LW*—for use with lightweight aggregate, hand application; *Machine Application*—for use with sand or lightweight aggregate. Complies with ASTM C-28 and Federal Specifications No. SS-P-402 Type N. **Limitation:** not recommended for use with perlite aggregate and machine applied, when vertical lift is over 30 ft. or hose length exceeds 150 ft.

STRUCTO-BASE Gypsum Plaster is a special gypsum basecoat plaster that develops higher strengths than conventional plasters. It is recommended for such areas as handball courts, hospital corridors, schools, etc., or wherever a high strength basecoat plaster is necessary. Complies with Federal Specifications SS-P-402, Type N, and ASTM Designation C-28 for "gypsum neat plaster" including the added requirement of 2,800 lbs. psi.

STRUCTO-LITE Plaster is a mill-mixed perlite aggregated gypsum cement plaster which requires the addition of only water at the job site. It is formulated in four types: *Regular*—for use over gypsum lath, hand application; *Masonry*—for use on high suction unit masonry base only, hand application; *Regular for Machine Application*—for use over gypsum lath; *Masonry for Machine Application* on high suction unit masonry.

STRUCTO-LITE weighs less than half as much as sanded basecoat plaster; has a "k" factor of 1.74, providing three times the insulation of sanded plaster. For this reason STRUCTO-LITE is not recommended for use with radiant heated panels. The added fire protection afforded by STRUCTO-LITE is the outstanding contribution of the product. Over-all cost is comparable to job-mixed lightweight aggregate plaster. Complies with ASTM C-28 for gypsum ready-mixed plaster.

Limitations: (1) STRUCTO-LITE is not recommended for use over metal lath when a smooth trowel lime finish is to be used. It may be sand float finished, or used as a base for acoustical plasters or tile. (2) Not recommended for machine application when vertical lift is over 30 ft. or when pumped through hoses in excess of 150 ft.

Portland Cement-Lime Plaster is required for interior use where high moisture conditions exist, or as an interior basecoat for stucco. Prepared on the job as follows:

Scratch and Brown Coats—In portland cement-lime-sand basecoats, up to 2 bags of MORTASEAL Mason's Lime or RED TOP Mason's Hydrated Lime (2 cu. ft. lime putty) per bag of portland cement can be used as a plasticizing agent, depending on whether the base is cement block or metal reinforcing mesh over building paper. The higher lime content is applicable to mortars used over cement block, where greater plasticity and water retention are required.

Finish Coat—ORIENTAL* Exterior Stucco (mill-mixed), a white, or colored float or texture finish plaster.

Limitations of portland cement plaster: (1) Scratch, brown and finish coats require curing with water after set; (2) Must not

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be applied directly to smooth, dense surfaces, gypsum lath or gypsum block. Self-furring metal lath must be secured to such surfaces before plaster is applied; (3) Control joints should be provided to compensate for the shrinkage of the portland cement mortar during drying; (4) A Keenes cement-lime putty finish must never be used over a portland cement basecoat.

Use of Aggregates with Gypsum Plasters

maximum recommended proportions

plaster base	no. of coats	type of coats	maximum quantity of aggregate, in cu. ft. to be used with 100 lbs. of neat gypsum plaster			
			under smooth trowel finishes		under other finishes	
			sand (1)	perlite	sand (1)	perlite
GYPSUM LATH	3	scratch brown	2 3	2 2	2 3	2 3
	2	basecoat	2½	2	2½	2
METAL LATH	3	scratch brown	2 3	— —	2 3	2 2
UNIT MASONRY	3	scratch brown	3 3	3 3	3 3	3 3
	2	basecoat	3	3	3	3

(1) Approximately six No. 2 shovels of sand equal 1 cu. ft.
Note: In a construction system which has metal lath as the plaster base, perlite or vermiculite aggregate is not recommended for use in the basecoat plaster, unless a float or acoustical finish is used.

Technical Data—Basecoat Plasters

plaster		mix	compressive strength psi—dry (1)	weight lb. cu. ft. —dry	conductivity (K)
STRUCTO-LITE	(regular)		600-800	50	1.74
wood fiber		neat	1500-2000	82	3.15
wood fiber	(sand)	100:1	1200-1600	97	—
STRUCTO-BASE	(sand)	100:2	2800-3200	124	—
RED TOP gypsum plaster mixed with—	sand	100:2	750-1100	107	5.51
		100:2½	650-850	108	—
		100:3	550-750	109	5.60
	perlite	100:2	600-800	48	1.64
		100:3	450-600	41	1.31
	vermiculite	100:2	400-525	48	1.74
		100:3	250-325	41	1.42

(1) Average Laboratory Test Results. Figures may vary slightly for products from individual mills. Tested in accordance with ASTM C472.

2. Finish Coat Plasters

description

There are several types of gypsum finish plasters; some used with the addition of water only, and others which are a blend of gypsum, lime and water, or gypsum, lime, sand and water.

Since the finish coat must be compatible with the basecoat, care must be taken in the selection of the finish coat materials in relationship with the characteristics of the basecoat.

Three general classifications of finishing materials are (1) prepared finishes; (2) smooth trowel finishes; (3) sand float finishes.

function

The finish coat serves as a leveling coat, as a base for decoration and provides the required resistance to abrasion.

Gauging plasters impart an early hardness and strength, minimizing the shrinkage characteristic of lime.

limitations

1. A smooth trowel finish should not be used over lightweight aggregate gypsum basecoat applied over metal lath. A sand float finish or an acoustical plaster is recommended.

2. Where the gypsum basecoat is STRUCTO-LITE or contains lightweight aggregate (perlite or vermiculite) and a smooth trowel finish is used, the finish coat should be RED TOP Gauging Plaster and lime, with addition of ½ cu. ft. of perlite fines or 50 lbs. of No. 1 white silica sand per 100 lbs. gauging plaster.

3. Gypsum or lime base finishes, including Keenes cement, should not be used directly over a portland cement basecoat or over concrete block or other masonry surfaces.

4. In smooth trowel finishes, gauging plasters providing an extremely hard surface, such as STRUCTO-GAUGE and Keenes cement, must not be used over STRUCTO-LITE Plaster, or a basecoat with a lightweight aggregate.

See the chart following for selection of finish coat materials.

ORIENTAL Interior Stucco—A white finish plaster for a sand float or textured finish. May be spray-applied with a hand spray gun; should not be used for smooth trowel finishes. Requires only the addition of water. Provides excellent hardness and great durability.

ORIENTAL Exterior Stucco is a mill prepared, water-resistant finish for use over exterior portland cement-lime basecoats only. Requires addition of water only. Float, texture, stipple sponge, spatter-dash or rough coat finishes are easily applied; not designed for smooth trowel finish. Available in white for spray application; in white and 10 colors for hand application.

RED TOP Concrete Finish—A new spray-textured decorative plaster finish for monolithic concrete surfaces. A gauged trowel coat is first applied to level concrete form irregularities, followed by a spray coat that gives a pleasing texture. Use of this finish minimizes need for buffing and grinding of concrete, and permits maximum re-use of forms. It is highly plastic, easily pumped to upper stories, and dries to a dense, white finish requiring no further decoration. Concrete Finish is applied only to surfaces which have first been treated with a high quality plaster bonding agent.

DIAMOND Finish Plaster is a new interior finish designed to provide exceptional surface hardness—1½ times greater than a 1 to 3 job mix of regular gauging and lime. Mill prepared; requires addition of water only, thus saves labor at site. Provides greater resistance to cracking and delamination; has stabilized set, excellent troweling characteristics. Two formulations available: *Regular Set*, for use over conventional sanded gypsum basecoat, and *Quick Set*, for use over thin veneer basecoat such as IMPERIAL Plaster. **Limitation:** not for use over lightweight aggregate gypsum basecoats.

gauging plasters (for blending with lime putty)

STRUCTO-GAUGE high-strength gypsum gauging plaster provides extreme hardness and resistance to surface abrasion; Quick or Slow Set. Complies with ASTM C-28 and Federal Specification SS-P-402, with the added requirement of 5000 psi.

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RED TOP Keenes Cement—A dead burned gypsum gauging, which requires extensive troweling except in regular sand float finishes. This troweling densifies the surface for hardness and resistance to surface abrasion. Complies with ASTM C-61 and Federal Specification SS-P-00410 Type I (Regular), II (Quick Troweling).

CHAMPION* and STAR* WHITE Gauging Plaster—These conventional quick and slow set gauging plasters comply with ASTM C-28 and Federal Specification SS-P-402, Type G.

RED TOP Gauging Plaster—Similar to CHAMPION and STAR Gauging except it comes in a slightly darker color. Complies with ASTM C-28 and Federal Specification SS-P-402, Type G.

Monotron Surface Hardness

(Kilograms required to force a 10 mm. diameter steel ball .01" into plaster face)

gauging-lime ratio	STRUCTO-GAUGE	regular gauging	Keene's Cement	
			regular	quick-troweling
1:4	27	24	14	19
1:2	48	34	19	25
1:1	105	51	27	37
2:1	162	74	34	51
4:1	206	96	40	63

finishing limes

IVORY Double Hydrated Finishing Lime—A 92% hydrated finishing lime. Does not require soaking, and virtually eliminates the possibility of future expansion within the finish coat because of unhydrated magnesium oxides. Complies with ASTM C-206, Type S, and Federal Specification SS-L-351, Type F (not more than 8% unhydrated oxides).

RED TOP and GRAND PRIZE* Normal Hydrate Finishing Lime—Hydrate lime which requires soaking at least 16 hours to develop proper plasticity and the degree of hydration necessary prior to use. Complies with ASTM C6, Type N, and Federal Specification SS-L-351, Type F.

RED TOP Finish Quicklime—High calcium finishing lime which requires 16 hours of soaking to develop a proper plasticity and the required degree of hydration prior to use. Complies with ASTM C5 and Federal Specification SS-Q-351.

high-strength veneer plasters

IMPERIAL Plaster is a new thin-coat interior product receiving rapid acceptance because it trims days from plaster finishing schedules, provides exceptionally high strength and abrasion resistance (3,000 psi). Yet its applied cost averages only slightly above conventional drywall cost. Applied to thickness of 1/16" to 3/32"; requires only the addition of clean water. Qualifies for ratings of up to two hours and 54 STC in metal frame and solid gypsum constructions (see USG Folder a-1147); of one hour and up to 53 STC in wood frame assemblies (see USG folder a-1337). Available in four formulas:

Hand Tool Application and *Machine Application Finishes*—for single-coat application composed of scratch coat and immediate doubling back (except in suspended or furred ceilings), directly over special gypsum IMPERIAL Plaster Base, glass-fiber tape and special corner bead. Provides a smooth trowel, float, or spray texture finish ready for decoration.

application data—USG Finish Coat Plasters

description	finish texture	physical properties	proportion by dry weight gauging to lime	workability factor	comments	cost index
ORIENTAL Interior Stucco	Float or Texture Finish	Hard and Resistant to Abrasion	Neat	1	Available in white. Mill control of aggregate, size and proportioning.	160
STRUCTO-GAUGE and Lime Putty	Smooth Trowel	Extremely Hard and Resistant to Abrasion	1:1	2	Use for handball courts, corridors over a wood fiber, STRUCTO-BASE or IMPERIAL Plaster basecoat.	150
		Hard and Resistant to Abrasion	1:2	1	Use over a wood fiber, sanded gypsum or IMPERIAL Plaster basecoat.	125
DIAMOND Finish	Smooth Trowel	Hard and Resistant to Abrasion	Neat	1	Use for all hard-wear interiors over conventional sanded or IMPERIAL Plaster basecoat.	100
Keenes Cement and Lime Putty	Smooth Trowel	Hard and Resistant to Abrasion	4:1	7	Use for handball courts and psychopathic wards over a wood fiber basecoat.	180
		Medium Hard & Resistant to Abrasion	2:1	4	Use for hospitals and schools over a wood fiber or sanded gypsum basecoat.	170
Gauging Plaster and Lime Putty	Smooth Trowel	Standard	1:2	1	For normal use; over lightweight aggregate basecoat add ½ cu. ft. of Perlite fines or 50 lbs. of #1 silica sand per 100# gauging.	100
Keenes Cement, Lime Putty and Sand	Float Finish	Hard	100 lbs. Keenes 50 lbs. Lime 400 lbs. Sand	1	Commonly used float finish, may be satisfactorily colored.	125
Gauging Plaster, Lime Putty and Sand	Float Finish	Standard	50 lbs. Gauging 100 lbs. Lime 400 lbs. Sand	1	For normal use over any basecoat.	100
ORIENTAL Exterior Stucco	Float or Texture Finish	Extremely Hard and Resistant to Abrasion	Neat	3	For use over a Portland cement lime basecoat. Available in white and 11 colors.	150
IMPERIAL Plaster Finish	Smooth Trowel or Float Finish	Hard and Resistant to Abrasion	Neat	1	For use over a special IMPERIAL Plaster Base. No basecoat required.	150
RED TOP Radiant Heat Plaster	Smooth Trowel, Texture or Float Finish	Extremely Dense; Resists heat deterioration	Neat	1	Use over electric cable on RED TOP Radiant Heat base in wood frame or concrete ceilings.	150

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Hand Tool Application and *Machine Application Basecoats*—for use where two-coat application and conventional finish are preferred. Can be applied to either IMPERIAL Plaster Base, directly to concrete block or over a bonding agent on monolithic concrete. Formulated to receive high-strength gauged lime putty, DIAMOND Finish Plaster, STRUCTO-GAUGE-lime, or Keenes-lime-sand float finishes.

The machine-application basecoat and finish are spray-applied in a patented process. See USG Folder f-1867 for other components used in these IMPERIAL Plaster systems.

RED TOP Radiant Heat Plaster is a new high-density formulation for use with electric cable ceilings. Allows higher operating temperatures than with other gypsum products, provides more efficient heat transmission and greater resistance to heat deterioration. Hand-applied in fill coat to embed cable, then in finish coat to total thickness of ¼". Used over special RED TOP Radiant Heat Plaster Base attached to wood joists (see USG Folder b-1517), to metal furring channel or suspended metal grillage, or over a bonding agent directly to monolithic concrete ceilings. Mill prepared, requires addition of water only.

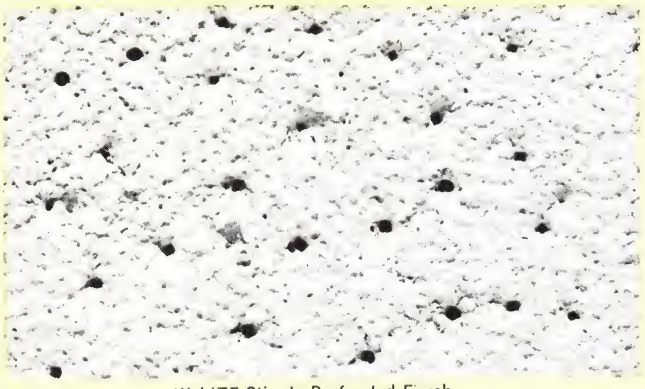
3. Acoustical Plasters

United States Gypsum manufactures two types of sound-absorbing, decorative finish acoustical plasters—HI-LITE* and AUDICOTE*. Each has certain characteristics which influence its selection. The following tables compare their light reflectance, insulation, and sound-absorption values.

	finish	light reflectance percent (1)		heat insulation "k" factor (2)
HI-LITE	Stippled	.80		.50
	Stipple-Perforated	.77		
AUDICOTE	Machine Textured	Satin White	.65	.50
		Special White	.70	

	finish	sound absorption frequencies at cycles shown (3)						nrc
		125	250	500	1000	2000	4000	
HI-LITE	Stippled	.41	.26	.59	.78	.84	.65	.60
	Stipple-Perforated	.20	.24	.50	.76	.83	.76	.60
AUDICOTE	Machine Texture	.26	.28	.53	.67	.73	.66	.55

Laboratory test data above are the results of tests on representative panels. It is not always possible to achieve these results in the field. Care must be taken to mix the material to specified consistencies and applied to uniformly full grounds. (1) Light reflectance from tests at an independent recognized laboratory. (2) Heat insulation data from tests at USG Research Laboratory. (3) Sound absorption from standard tests at a recognized laboratory.



HI-LITE Stipple-Perforated Finish

HI-LITE Acoustical Plaster is pure white with excellent light reflective characteristics, making it particularly adaptable for use in schools and office buildings where light reflectance and efficiency of illumination are important considerations. Its relatively high moisture resistance makes it an excellent choice for acoustical treatment in natatoriums and other areas in which high humidities are anticipated. HI-LITE Acoustical Plaster resists the migration of rust stains.

For hand application over properly prepared gypsum plaster or Portland cement-lime plaster basecoats; develops a harder finished surface than many acoustical materials.

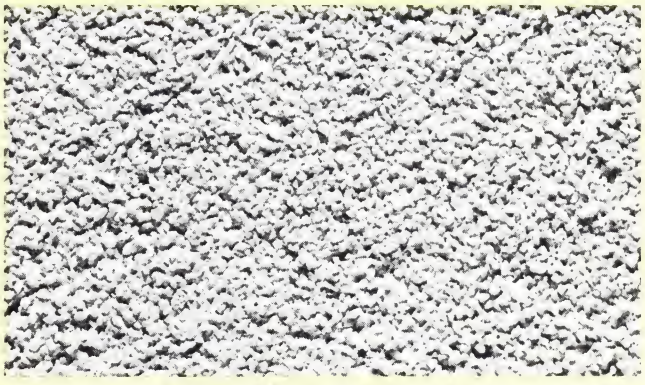
When stippled, HI-LITE exhibits outstanding sound absorption characteristics at the lower frequencies. It may be redecorated with up to four coats of spray-applied TEXOLITE* Standard Paint without appreciably reducing sound characteristics; may be vacuum cleaned.

Limitations: HI-LITE (1) must be machine mixed in strict accordance with directions to develop proper density and working qualities; (2) is formulated for hand application only; (3) is more durable than most acoustical materials, but is designed for use on ceilings or wall areas not subject to contact; (4) when perforated, a special perforator with rust-resistant prongs should be used; (5) it is not recommended for use over radiant heating installations; (6) is not recommended for direct application to monolithic concrete surfaces.

AUDICOTE Acoustical Plaster is a low-cost acoustical material designed for either machine or hand application over a wide range of surfaces. It can be applied over properly prepared gypsum or Portland cement basecoats, monolithic concrete, prefabricated concrete units.

The uniform texture resulting from spray application makes AUDICOTE particularly suitable for use on large continuous ceiling areas. Through modifications of machine procedures and spray techniques, many pleasing textures are possible. It is readily adaptable to tinting, and incorporation of special aggregates to further increase the design and decorative possibilities. It may be redecorated with up to two coats of spray-applied TEXOLITE Standard Paint with no significant loss in Noise Reduction Coefficient. Up to four coats result in only a minor reduction in sound absorption characteristics. It may be economically refinished with a spray coat of AUDICOTE. Available in Satin White and Special White colors; may also be tinted on the job.

Limitations: (1) AUDICOTE is designed for use on ceiling and wall areas not subject to contact, excessive vibration or high moisture; (2) precautions must be taken under certain circumstances to prevent the migration of water-borne stains to the surface of AUDICOTE (see Specifications); (3) not recommended for use over radiant heating installations.



AUDICOTE Machine-Textured Finish

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4. Special Plasters

RED TOP Moulding Plaster is used in specialized work such as cast ornamental enrichments or running cornices. The grind is conducive to fine detail; controlled set helps obtain exact reproduction. Available in white and grey colors.

RED TOP Casting Plaster, for general casting shop use, produces excellent detail in fine plaques and art statuary. The material has outstanding characteristics of plasticity, maximum surface hardness, strength. Only water is added.

general plastering specifications

I. scope—Unless otherwise shown on the drawings, all walls and ceilings shall be plastered as herein described.

II. general provisions—In cold weather, the temperature of the building shall be maintained in the uniform range above 55° F. for an adequate period prior to the application of plaster, while the plastering is being done, and after the plaster is dry. The heat shall be well distributed in all areas, with deflection or protective screens used to prevent concentrated or irregular heat on plaster areas near source. When required, heat shall be furnished by . . .

Proper protection should be provided during plastering for finished door and window frames and other designated areas which do not receive a plaster finish.

Ventilation shall be provided to properly dry the plaster during and subsequent to its application. In glazed buildings, this shall be accomplished by keeping windows open sufficiently to provide air circulation; in enclosed areas lacking normal ventilation, provisions must be made to mechanically remove moisture-laden air.

If glazed sash are not in place and the building is subjected to hot, dry winds or temperature differentials from day to night of 20°F or more, openings shall be screened with cheesecloth or similar material.

III. surface preparation

a. Monolithic concrete to which a plaster bonding agent is to be applied shall be free of dirt, dust, grease, wax, oil or other unsound surface conditions. Laitance and efflorescence shall be chemically removed.

b. Monolithic or unit masonry surfaces that exhibit high suction may be moderately wetted immediately before plastering.

c. Where AUDICOTE Acoustical Plaster is indicated for application direct to smooth monolithic concrete, reinforcing bar chair legs shall be either galvanized or coated with rust inhibitive paint, and use of nails or other raw steel against forms or surface of concrete held to a minimum. Where metal is exposed in spite of these precautions, and where AUDICOTE is to be applied directly against corner beads or other metal accessories, the metal should be treated with one coat of aluminum paint.

IV. grounds—Plaster thicknesses shall be as shown on plans; however, in no case shall the grounds be less than:

USG Metal Lath—⅝″ (from face of lath)
ROCKLATH Plaster Base—½″
Long Length ROCKLATH—¾″
PYROBAR Partition Tile or other Masonry Units—⅝″
Monolithic Concrete Ceilings—⅛″ (⅜″ maximum)
Monolithic Concrete Walls—⅛″ (⅝″ maximum)
IMPERIAL Plasters—1/16″″ to ⅛″
RED TOP Radiant Heat Plaster—¼″ (over special gypsum base); ⅜″ (over monolithic concrete)
HI-LITE or AUDICOTE Acoustical Plaster—½″ (over concrete); 15/16″ (over gypsum or metal lath)

V. materials—Plaster and all cementitious material shall be stored under cover, up off the ground or floor, and kept dry until ready for use. All materials herein specified shall be manufactured by the UNITED STATES GYPSUM COMPANY.

a. Basecoat Plaster shall be: (STRUCTO-BASE Gypsum Plaster) (RED TOP Wood Fiber) (RED TOP Gypsum Plaster) (STRUCTO-LITE) (IMPERIAL H.T.A. or M.A.).

b. Aggregate shall be: (Sand) (Perlite) meeting ASTM C-35 requirement. Sand for float finishes shall be a graded (white) silica sand passing a (30 mesh) (20 mesh) screen.

c. Water shall be clean and fit to drink, free from oil, acid, alkali or vegetable materials.

d. Finish Lime shall be: (IVORY) (GRAND PRIZE*) (RED TOP).

e. Gauging Plaster shall be: (STRUCTO-GAUGE) (Keenes Cement) (STAR) (CHAMPION) (RED TOP).

f. Prepared Finish shall be: (DIAMOND Finish) (IMPERIAL H.T.A. or M.A. Finish) (RED TOP Radiant Heat Plaster) (ORIENTAL Interior White Finish) (RED TOP Concrete Finish).
For IMPERIAL M.A. Finish: *Catalyst* shall be IMPERIAL Catalyst.

g. Acoustical Plaster shall be: (HI-LITE) (AUDICOTE).

h. Plaster Ornaments and Mouldings shall be made with RED TOP (Moulding) (Casting) Plaster.

i. Exterior Stucco Finish shall be: ORIENTAL Exterior Stucco.

VI. grouting—Grout shall consist of STRUCTO-LITE or RED TOP Gypsum Plaster sanded 100:2.

a. All steel door frames in solid plaster and steel stud partitions shall be grouted prior to lathing.

b. All 2½″ metal base shall be grouted.

VII. basecoat proportions—Basecoat plasters shall be mixed to provide compressive strength of _____ psi—dry (specify from technical data, page 3).

VIII. mixing of basecoat—Basecoat plasters may be hand mixed or mechanically mixed to a uniform consistency following the manufacturer's directions.

IX. basecoat application—All plaster basecoat shall be applied by (hand) (machine) in (2) (3) coats (see description, page 1).

a. Two-coat work: Over gypsum lath and masonry, the base (first) coat shall be applied with sufficient material and pressure to form a good bond to the base and to cover well, and then be doubled back to bring the plaster out to grounds, straightened to a true surface with rod and darby without the use of additional water, and left rough to receive the finish (second) coat.

Three-coat work: The scratch (first) coat shall be applied with sufficient material and pressure to form good full keys on metal lath, and a good bond on other bases, and then be cross-raked. The brown (second) coat shall be applied after the scratch (first) coat has set firm and hard, brought out to grounds and straightened to a true surface with rod and darby without the use of additional water, and left rough to receive the finish (third) coat.

b. Optional Inclusions:

1. Solid Long Length ROCKLATH* *Partition:* The scratch coat shall be applied ⅜″ thick, with a maximum set of 3 hours, to each side of the lath, both sides to be scratch coated within a 3-hour interval. Cross-rake lightly in horizontal direction only. The brown coat shall be applied to the unbraced side after the scratch coats have set and partially dried (not less than 16 hours). After brown coat has set firmly (not less than 3 hours), carefully remove the braces and brown coat the second side. Brown coat shall be brought out to a true plane and left rough.

*Reg. U.S. Pat. Off.

2. Solid Studless Metal Lath Partition: The scratch coat shall be applied to the side opposite the bracing, and allowed to set and partially dry. The brown coat shall then be applied to the side opposite the braces, allowing it to set thoroughly before removing temporary braces. Next the brown coat shall be applied to previously braced side to bring the plaster out to grounds, straightened to a true surface with rod and darby without the use of additional water, and left rough to receive the finish coat.

3. Solid Channel Stud Metal Lath Partition: The scratch coat shall be applied to lath side and allowed to set and partially dry. The back-up coat shall then be applied to the channel side to full grounds, ½″ over channels, in not less than two operations and allowed to set. The brown coat on lath side shall then be applied to bring the plaster out to grounds, straightened to a true surface with rod or darby without the use of additional water, and left rough to receive the finish coat.

4. Resilient ROCKLATH *Plaster Base Ceiling:* Use three-coat method only, allowing the scratch coat to set and partially dry before applying brown coat.

5. BRACE-TITE* *System Ceiling:* The three-coat method is recommended. If the two-coat system is used, a minimum of 20 minutes must be allowed before doubling back and the setting time of the basecoat must not exceed 3 hours.

6. Monolithic Concrete: A plaster bonding agent shall be (hand) (spray) applied to concrete surface in a thin continuous film, at 55° F. or above. Basecoat plasters or RED TOP Concrete Finish shall be applied when film is slightly tacky or within two weeks. Fill and leveling coats of Concrete Finish shall be gauged sufficiently with RED TOP Gauging to permit immediate doubling back and firm grinding of a thin coat into the bonding agent. Immediately double back with a "sweetening coat" to level the surface; draw up finish taut and level by troweling. (Sand Float finish—add up to 20 lbs. of sand per bag of RED TOP Concrete Finish, gauge approximately 15% by weight, and allow to stiffen prior to floating.) (Smooth Trowel finish—use 15% to 20% slow set gauging, mix to fairly stiff consistency, apply and trowel in same manner as with regular lime putty finish.)

7. Portland Cement Basecoats shall be proportioned (specify from page 3), and applied in two coats. Scratch coat shall be cross-raked and after setting damp cured for not less than 48 hours. Brown coat shall be damp cured after setting for not less than 48 hours.

8. IMPERIAL *Plaster Basecoats*, either the Hand Tool Application or Machine Application formulation, when applied directly over concrete block, shall fill all voids and depressions including joints; after sufficient take-up of fill coat has occurred, scratch coat shall be applied (by hand or spray), left rough and allowed to set and dry prior to finish application. Monolithic concrete surfaces shall be finished by application of a plaster bonding agent in a thin continuous film, followed by fill coat of IMPERIAL Hand Tool Application Basecoat to present a true, even surface (conventional RED TOP Accelerators may be used to quicken the set); when fill coat is partially dry, scratch coat and immediate double-back second coat shall be applied to a 1/16″ to 3/32″ thickness.

9. Where plaster is flush with metal base, metal door frames, etc., a groove shall be made at the junction to reduce the possibility of chipping. Basecoat plaster shall be cut free from these metal sections before the plaster sets.

10. Basecoats in ORIENTAL *Exterior Stucco Applications* shall be mixed with MORTASEAL Mason's Lime (see USG Folder f-1946) and applied per manufacturer's directions.

X. preparation of lime

a. IVORY Lime shall be mixed with approximately 5½ to 6 gallons of water for each 50 lb. bag. Machine mix or box soak for immediate use, or may soak overnite.

b. GRAND PRIZE or RED TOP Lime shall be box soaked or machine mixed using approximately 6 gallons of water per 50 lb. bag, and allowed to soak for 16 hours.

XI. proportions of finish coats—Finish coat plasters shall be mixed in proportion by dry weight of____parts of gauging to____ parts of lime (specify from Application Data, page 4), according to the manufacturer's directions. Over lightweight aggregate basecoats, ½ cu. ft. of perlite fines or 50 lbs. of No. 1 silica sand per 100 lbs. of gauging plaster shall be added, or aggregated gauging shall be used.

XII. application of finish coats

a. Trowel Finish Coats shall be scratched in thoroughly and immediately doubled back to fill out to a smooth, dense surface for decoration free of surface blemishes and irregularities. Finish coat shall be applied as thin as possible, preferably 1/16″ to not more than 1/8″ maximum thickness. Keenes Cement Finishes shall be troweled until the material sets.

b. Float Finish Coats shall be scratched in thoroughly and immediately doubled back to a true, even surface. Float using a (shingle) (cork) (wood) (carpet) or (rubber) float to bring aggregate to the surface to produce a finish of uniform texture free of slick spots, cat faces, and other blemishes. Use water sparingly in natural color, and no water shall be used on colored finishes. With ORIENTAL Exterior Stucco, no water shall be used in floating or texturing; surface shall be fog-sprayed with water for several days after setting.

c. Machine Applied Spray Finishes shall be uniformly applied to produce a texture approved by the architect.

d. IMPERIAL Plaster Hand Tool Application Finish shall be hand applied in tight, thin first coat to embed tape and fill beads; then tight, thin scratch coat and immediate double-back coat to a thickness of from 1/16″ to 3/32″, in accordance with the manufacturer's directions.

Addition of Color: For float finish surfaces only, Colortrend Concentrated Colorant in (specify color) as manufactured by the California Ink Co., shall be added to mixing water prior to addition of IMPERIAL Plaster Hand Tool Application Finish and sand. Coloring agent shall be dispersed completely in mix. In floating the final surface, water may be used only to initially wet the float, and the texturing operation shall be completed prior to set of the IMPERIAL Plaster Finish.

e. IMPERIAL Plaster Machine Application Finish shall be machine applied to a thickness of 1/16″ to 3/32″, in accordance with the manufacturer's directions (see USG Folder f-1917 for sealing, painting specifications).

f. RED TOP Radiant Heat Plaster, in wood frame constructions, shall be applied according to manufacturer's directions (see specifications in USG Folder b-1517). In monolithic concrete ceilings, the surface shall be prepared with plaster bonding agent in a thin continuous film; RED TOP Radiant Heat Plaster shall be applied in same manner prescribed for wood frame ceilings except to total thickness of 3/8″—consisting of 5/16″ fill coat to completely cover the cable and anchor device, and 1/16″ finishing coat.

g. Acoustical Plasters shall be applied in not less than two coats, to full ½″ grounds, following the manufacturer's directions.

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h. Ornamental Plastering: Ornamental plaster shall be executed in accordance with the full-sized details shown on the drawings. Cornices and moldings shall be run full, straight and true with molding plaster, using clean cut metal templets conforming to the profiles shown on the drawings. Lines shall be in alignment, with true intersections, and accurate miters at corners and angles. Enriched ornamental work which cannot be run in place shall be cast with RED TOP Casting Plaster in gelatine molds. The work shall be solidly backed with jute or burlap, shall be properly reinforced with galvanized steel, and shall be securely stuck and wired in place with copper wires not lighter than 16 gauge. All joints shall be carefully made and neatly pointed so as to be invisible. All rough spots shall be eliminated with fine sandpaper, and the entire work left in proper condition, ready for decoration.

XIII. patching—Point up around trim and other work. Cut out and patch defective and damaged plaster. Patching of plaster shall match existing work in texture and finish and joinings with plaster previously applied shall finish flush and smooth.

XIV. completion—At the completion of the finish plaster work, all plaster shall be cleaned from beds, screeds, metal base and metal trim, leaving work ready for decoration by others. All plaster rubbish shall be removed from the building, leaving floors broom clean. Excess material, scaffolding, tools and other equipment shall be removed from the building and job site.

USG® Plaster Bases and Accessories

f

1867

A.I.A. File No. 10-D/20

description and utility

UNITED STATES GYPSUM produces the industry's broadest and best-known line of plaster bases, metal structural members and lathing accessories. From these have been engineered dozens of partition, ceiling and wall furring assemblies, each of which provides different characteristics of structural stability, fire rating and sound transmission loss. Performance and specification of these assemblies are covered in individual USG Systems Folders, which are keyed in turn to the USG Construction Selector index.

Basic information on the plaster bases and accessories available for such assemblies is included here. Proper use of USG plaster bases and plasters provides the secure bond necessary in order to develop strength and resistance to abuse and cracking. A "mechanical" bond is formed when plaster is pressed through the mesh or holes of the lath, forming keys on the back side—as with metal lath or perforated gypsum lath. A "suction" bond is formed when gypsum plaster is applied over gypsum lath and masonry bases; the tiny needle-like plaster crystals penetrate into the surface pores of the base by suction. When perforated gypsum lath is used, both suction and mechanical bonds are developed.

Seven groups of bases and accessories are covered in this catalog: (1) Gypsum Plaster Bases; (2) USG Metal Lath; (3) PYROBAR* Partition Tile; (4) USG Corner Reinforcements, Screeds and Control Joints; (5) USG Lath Attachment Clips and Screws; (6) USG Runners, Metal Bases and Accessories; (7) USG Structural Accessories.

Functions, properties and limitations are treated within each group. A general lathing specification appears on pages 11 and 12. For information on USG plastering products, see USG Catalog f-1857.

While requirements differ for each project, good practices for normal construction problems are well established. In the selection of plaster bases and accessories, the following general recommendations are listed in the order of preference:

Masonry Plaster Bases

1. PYROBAR Partition Tile
2. Dense Concrete Block
3. Clay Tile
4. Lightweight Concrete Block

A masonry partition to be plastered should be built with the same care as if the masonry were to be left exposed. Considerations should include (a) lintels over door frames; (b) good mortar, with full mortar beds and end joints; (c) masonry laid with a running bond; (d) chases held to minimum in size and number; (e) control joints in long runs; (f) control joints where masonry partitions abut concrete structural members.

Lath Plaster Bases

1. If the lath is embedded in the plaster as in a solid plaster partition, USG Metal Lath is the preferred base.

2. If the lath and plaster surface is a flat, thin diaphragm supported by a grillage or attached to studs, ROCKLATH is the preferred base, unless a scratch coat of wood fiber plaster is used with the metal lath.

Steel Studs

Partition systems incorporating steel studs can be evaluated on the basis of structural characteristics, section modulus and the ultimate tensile strength of the steel used in stud fabrication, and the stress skin action incident to the method of attachment. Composite results dictate this general order of preference:

1. TRUSSTEEL* Studs (see USG Folders a-1177 and a-1187)
2. USG Metal Studs (see USG Folder a-1197)
3. Non-load bearing Nailing Studs

*Reg. U.S. Pat. Off.

Solid Plaster Partitions

In solid plaster partitions, a 2″ thickness is the minimum recommended; the performance can be improved by increasing the thickness to 2¼″ or 2½″. The three lathing systems suitable for this partition are recommended in the following order:

1. USG ¾″ Channels and Diamond Mesh Metal Lath (see USG Folder a-1027)
2. USG ⅜″ Riblath, Studless (see USG Folder a-1017)
3. USG ½″ Long Length ROCKLATH (see USG Folder a-1036)

types and functions

1. Gypsum Plaster Bases

description

ROCKLATH*, IMPERIAL* and RED TOP* Radiant Heat plaster bases are gypsum lath in sheet form providing a rigid base for the economical application of gypsum plasters. A special gypsum core is faced with multi-layered laminated paper designed to check plaster slide and resist lath sag.

These gypsum bases are fabricated in thicknesses of ⅜″, ½″ and ⅝″, and in eight different products for specific uses as listed below. Complies with ASTM C37, Federal Specification SS-P-431a, and Interim Federal Specification SS-L-0030.

function

Incombustible—When used with gypsum plaster, gypsum lath provides for fire-resistant construction (for ratings, see USG Construction Selector).

Strength—When securely attached, adds lateral stability to the assembly.

Sound Resistance—Gypsum lath partitions faced with gypsum plaster on both sides have high resistance to sound transmission; resilient attachment (Page 6) further improves ratings (see USG Construction Selector).

Bonding—Gypsum plaster bonds to these bases with a safety factor far higher than required to meet usual construction standards.

Durability—Not harmfully affected by decay, dry rot or normal moisture; will not attract vermin.

Economy—Its low cost, ease and speed of erection and savings in plastering are outstanding. ROCKLATH, IMPERIAL and RED TOP plaster bases are made only by United States Gypsum.

limitations

1. Maximum frame spacing is dependent on thickness and type of lath used (see table, page 2).

2. Should be used with gypsum plaster only. Bond between lime or portland cement plaster and ROCKLATH is inadequate.

3. Gypsum lath and plaster, painted, has a vapor permeability of about 3¾ perms. For higher resistance to vapor transmission, Insulating ROCKLATH plaster base (see page 2) should be used.

4. Should not be used in areas exposed to excessive moisture for extended periods. USG galvanized metal lath and portland cement-lime plaster are recommended.

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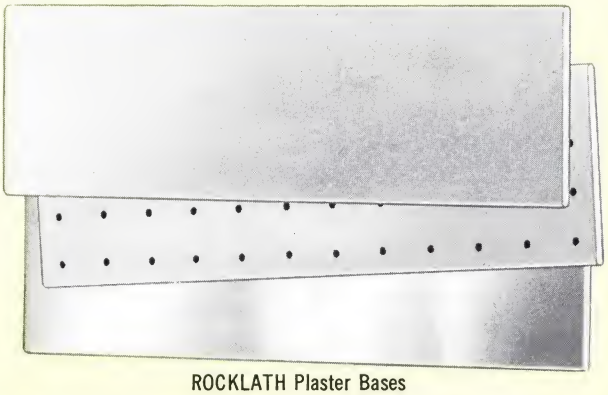


ROCKLATH Plaster Bases

Plain ROCKLATH Plaster Base is recommended for nail or staple application to wood and nailable steel framing, for clip attachment to wood framing, steel studs and suspended metal grillage, and for screw attachment to USG metal studs and furring channels. **Sizes:** 16″ x 48″, ⅜″ or ½″ thick; 16″ x 96″, ⅜″ thick (also made 16⅕″ wide for Pacific Coast area).

Perforated ROCKLATH Plaster Base is identical with Plain ROCKLATH except that ¾″ round holes are punched through the lath 4″ o.c. in each direction, one ¾″ diam. hole for each 16 sq. in. of lath area. This provides a mechanical key in addition to the natural plaster bond, and obtains higher fire ratings (see USG Construction Selector). **Limitation:** not recommended for attachment to ceilings, either wood framing or metal grillage, where the only support provided is by clips at edges.

ROCKLATH FIRECODE* Plaster Base is a gypsum lath which combines all the advantages of Plain ROCKLATH with additional resistance to fire exposure—the result of a specially formulated core containing special mineral materials. **Size:** nom. 16″ x 48″, ⅜″ thick.

Long Length ROCKLATH Plaster Base is manufactured for use in constructions requiring floor to ceiling height lath, such as the Solid ROCKLATH and Plaster Partition System and the USG Exterior Wall Furring System (see USG Folder a-1036). **Sizes:** 24″ wide, ⅜″ thick with square edges, ½″ thick with "V" edges, lengths mill cut as required up to 12 ft.

Insulating ROCKLATH Plaster Base offers all the advantages of Plain ROCKLATH as a rigid plaster base, is made in the same sizes, but has bright aluminum foil laminated to the back side. This creates an effective vapor barrier at no additional labor cost. Its vapor permeability of 0.67 perms is well below the 1.00 permeability limit permissible under FHA requirements. In addition, Insulating ROCKLATH provides positive insulation value when installed with the foil facing a ¾″ minimum air space. When used as a ceiling, under winter heating conditions its resistance value is approximately the same as for ½″ insulation board; in retarding downward heat flow in summer, its effectiveness is more than doubled to a resistance value of 10.06 including air space (see table, page 3). Corrosion and normal dust accumulation exert negligible

Frame Spacing and Attachment—ROCKLATH Plaster Bases

framing	max. frame spacing c. to c.	attachment	fastener spacing c. to c.
⅜″ ROCKLATH Plaster Base			
wood	16″	**Nails**—13 ga., 1⅛″ long 19/64″ flat head, blued	4 per 16″ width of lath
		Staples—16 ga. galv. flattened wire, flat crown 7/16″ wide, ⅞″ divergent legs	
		R-1 & R-2 Clips	1 per 16″
USG metal stud	16″ or 24″‡	**Screws**—USG ¾″ Type S	12″, 2 per board
		Clips—Field Clip MS-1	16″ along stud
TRUSSTEEL* stud	16″	TL-1 clips	16″ along stud
		TR-1 resilient clips (& accessories)	
metal nailing stud	16″	Nail or staple as recommended by stud manufacturer	4 per 16″ width
¾″ channel	16″	BRACE-TITE* clips (& accessories)	1 per 16″ width
USG metal furring channel	16″	USG ¾″ screws, Type S	3 per 16″ width, 1″ from edges & center
½″ ROCKLATH Plaster Base			
wood	24″	**Nails**—13 ga., 1¼″ long, 11/64″ flat head, blued	5 per 16″ width of lath
		Staples—16 ga. galv. flattened wire, flat crown 7/16″ wide, 1″ divergent legs	
½″ IMPERIAL Plaster Base			
wood	16″ to 24″	**Nails**—1¼″ 13 ga., 15/64″ head, ring or barbed shank, blued, polished, or cem. ctd.	7″ ceilings 8″ walls
		Screws—USG 1¼″ Type W	12″
		Nails for Type X lath—1⅝″ 5d cooler type—cement coated	6″ ceilings 7″ walls
USG metal stud	16″	**Screws**—USG 1″ Type S	12″
RC-1 resil. channel	16″ clgs. 24″ walls	**Screws**—USG 1″ Type S	12″

‡ 3-coat plastering required with 24″ stud spacings

framing	max. frame spacing c. to c.	attachment	fastener spacing c. to c.
⅝″ IMPERIAL Plaster Base			
wood	24″	**Nails**—1⅜″ 13 ga., 15/64″ head, ring or barbed shank, blued, polished, or cement coated	7″ ceilings 8″ walls
		Screws—USG 1¼″ Type W	12″
		Nails for Type X lath—1⅞″ 6d cooler type—cement coated	6″ ceilings 7″ walls
USG metal stud	24″	**Screws**—USG 1″ Type S	12″
RC-1 resil. channel	24″	**Screws**—USG 1¼″ Type W for channel to framing; USG 1″ Type S for plaster base	12″
½″ RED TOP Radiant Heat Plaster Base			
wood joists	16″	**Nails**—1¼″ 13 ga., 15/64″ head, ring or barbed shank, blued, polished, or cement coated	7″ ceilings
		Screws—USG 1¼″ Type W	12″
		Nails for Type X lath—1⅝″ 5d cooler type—cement coated	6″ ceilings
RC-1 resil. channel	16″	**Screws**—USG 1¼″ Type W for channel to framing; USG 1″ Type S for plaster base	12″
USG metal channel	16″	**Screws**—USG 1″ Type S	12″
⅝″ RED TOP Radiant Heat Plaster Base			
wood joists	24″	**Nails**—1⅜″ 13 ga., 15/64″ head, ring or barbed shank, polished, blued, or cement coated	7″ ceilings
		Screws—USG 1¼″ Type W	12″
RC-1 resil. channel	24″	**Screws**—USG 1¼″ Type W for channel to framing; USG 1″ Type S for plaster base	12″
USG metal channel	24″	**Screws**—USG 1″ Type S	12″

*Reg. U.S. Pat. Off.

effect on the vapor barrier and insulation characteristics of Insulating ROCKLATH.

Long Length Insulating ROCKLATH also with aluminum foil laminated to the back side, is used primarily for furring exterior masonry walls (see USG Folder a-1036). **Sizes:** 24″ wide, ⅜″ thick, lengths mill cut as required up to 12 ft.; formed with square edges. Thermal resistance values of Insulating ROCKLATH are as follows:

Surface, Heat Flow & Season			Insulating ROCKLATH ⅜″	Insulating ROCKLATH ½″
horizontal	(up)	winter	2.69	2.82
horizontal	(dn)	summer	4.88	5.01
vertical	(hor)	winter	3.89	4.02
vertical	(hor)	summer	3.89	4.02

Note: Resistances are based on still air film, ½″ sanded plaster, and lath with one reflective surface.

IMPERIAL Plaster Base is a special gypsum lath in large sheet form, with strength and absorption characteristics designed for use with IMPERIAL Plasters (see USG Folder f-1857). Available in Plain and Type X core, 48″ wide, ½″ or ⅝″ thick, 8 to 12 ft. lengths. The Type X is a fire-rated core which gives added fire protection and is listed by U.L., Inc. under Label Service.

The exclusive 1/16″ to 3/32″ IMPERIAL thin-coat Finish is applied after joints have been finished with special IMPERIAL glass fiber lino-weave tape. USG #800 corner bead is used. Using the Type X base, the system qualifies for ratings of up to two hours and 54 STC in metal frame and solid gypsum constructions (see USG Folder a-1147); of one hour and up to 53 STC in wood frame assemblies (see USG Folder a-1337).

RED TOP Radiant Heat Plaster Base is a specially fortified large-size gypsum lath, used with RED TOP Radiant Heat Plaster in electric cable ceilings. Available 48″ wide, regular ½″ or ⅝″ thick, Type X ½″ thick, 8 to 12 ft. lengths. Nailed or screw-applied to wood joists; screw-applied to USG metal furring channels or RC-1 resilient channels; joints are reinforced with 2½″ wide IMPERIAL glass fiber tape, staple applied. The system (see USG Folder b-1517) improves heat emission and resistance to heat deterioration.

2. USG Metal Lath

description

USG metal lath is sheet steel that has been slit and expanded to form a multitude of small mesh openings. It is made in Diamond Mesh, Riblath and Stuccomesh types and in two different weights for each style. All are manufactured from rust-resisting copper alloy steel, further protected by a coating of black asphaltum paint, except 3.4 lb. diamond mesh which is also available in galvanized steel.

function

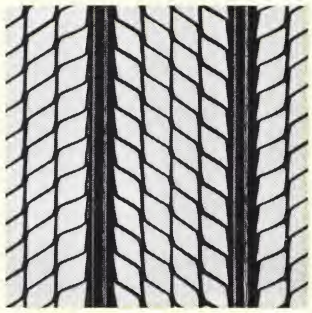
Strength—Metal lath embedded within the plaster provides strength in a manner similar to steel reinforcement in concrete slabs, thus offering high resistance to transverse impact. It decreases the hazards of serious cracks and failures due to structural movement of the frame.

Flexibility—Readily shaped to ornamental contours to a degree not possible with other plaster bases.

Quality Work—The manner in which metal lath accepts plaster makes the use of over-aggregated plaster in the scratch coat impractical.

Fire Resistance—Metal lath and gypsum plaster provide high fire ratings (see USG Construction Selector).


USG Junior Diamond Mesh Lath


USG 4-Mesh Z-Riblath


USG ⅜″ Riblath


USG ¾″ Riblath

Identification—Ends of bundles of USG Metal Lath are spray painted in different colors for various weights, thus simplifying inspection at the job site.

USG Junior Diamond Mesh Lath is a small diamond mesh metal plaster base (approx. 11,000 meshes per sq. yd.). A general all-purpose lath, best for ornamental, contour plastering. The small meshes conserve plaster and reduce droppings.

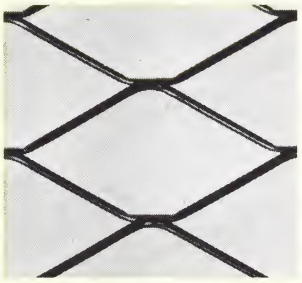
Also available in self-furring type having ¼″ "dimple" indentations spaced 1½″ o.c. each way for use as exterior stucco base, column fireproofing and for replastering over old surfaces. **Size:** 27″ x 96″. **Weights:** 2.5 lbs. (end painted white) and 3.4 lbs. (end painted red) per sq. yd.

USG 4-Mesh Z-Riblath is a "flat rib" type of lath with smaller mesh openings, suitable for "double-up" type of plastering. An excellent nail-on lath, or for tie-on work on flat ceilings. **Size:** 27″ x 96″. **Weights:** 2.75 lbs. (end painted white) and 3.4 lbs. (end painted red) per sq. yd. **Limitation:** not for contour plastering; Diamond Mesh preferred.

USG ⅜″ Riblath comes in a herringbone mesh pattern with ⅜″ V-shaped ribs running lengthwise of the sheet at 4½″ intervals, with inverted intermediate 3/16″ ribs. The heavy ribs provide exceptional rigidity. Used when supports are spaced more than 16″ o.c. and not more than 24″ o.c. and for 2″ solid studless metal lath and plaster partitions. Also used as a centering lath for concrete floor and roof slabs. **Size:** 27″ x 96″ (other lengths available). **Weights:** 3.4 lbs. (end painted red) and 4.0 lbs. (end painted yellow) per sq. yd. **Limitation:** its extreme rigidity makes ⅜″ Riblath unsuitable for contour plastering—use Diamond Mesh Lath; due to ⅜″ rib, minimum ground thickness must be 1″.

USG ¾″ Riblath provides a herringbone mesh pattern with ¾″ deep V-shaped ribs lengthwise of the lath at 6″ intervals. It is a structural lath, providing the dual functions of centering and reinforcement for concrete floor and roof slabs. **Sizes:** 2′ x 8′, 2′ x 10′ and 2′ x 12′. **Weights:** .60 lb. and .75 lb. per sq. ft. **Limitation:** not recommended as a plastering lath.

USG Expanded Metal Stuccomesh is a 1⅜″ x 3⅛″ diamond mesh pattern designed as a base for exterior stucco, hand or pump applied. **Size:** 48″ x 99″. **Weights:** 1.8 lbs. and 3.6 lbs. per sq. yd. **Limitations:** should be applied with 1½″ galvanized self-furring nails; when used over sheathing other than wood, fasten with longer nails providing minimum penetration of 1⅛″ into studs.



USG Stuccomesh

Types and Weights of USG Metal Lath and Spacing of Supports

type of lath (1)	weight per sq. yd.	size sheets	maximum allowable spacings				
			vertical supports			horizontal supports	
			wood	metal		wood or concrete	metal
				solid partitions	others (5)		
Diamond Mesh	2.5 lb.	27″ x 96″	16″	16″	12″	(4)	(4)
Diamond Mesh (2)	3.4 lb.	27″ x 96″	16″	16″	16″	16″	13½″
⅛″ Z-Rib	2.75 lb.	27″ x 96″	16″	16″	16″	16″	12″
⅛″ Z-Rib	3.4 lb.	27″ x 96″	19″	24″	19″	19″	19″
⅜″ Rib	3.4 lb.	27″ x 96″	24″		24″	24″	24″
⅜″ Rib	4.0 lb.	27″ x 96″	24″		24″	24″	24″
Stuccomesh (3)	1.8 lb.	48″ x 99″	16″(3)				
Stuccomesh	3.6 lb.	48″ x 99″	16″(3)				
¾″ Riblath	per sq. ft.	2′ x 8′ 2′ x 10′ 2′ x 12′					
	0.60 lb. 0.75 lb.						

Notes: (1) All types made from copper alloy steel containing from 0.20% to 0.25% pure copper, and painted with rust-inhibitive black asphaltum paint. (2) Available in both copper alloy and galvanized steel. (3) Generally applied over exterior sheathing. (4) Not recommended except for fireproofing of steel shapes. (5) Including vertical furring.

Attachment—USG Metal Lath

framing	attachment	fastener spacing c. to c.
wood studs	**Nails**—4d common, driven to ¾″ penetration and bent over to engage 3 strands on through the rib	6″
	Nails—1″ roofing nail 7/16″ head, engaging 2 strands on through the rib	6″
	Staples—1″, 14 ga. wire staples, engaging 2 strands on a rib	6″
wood joists	**Nails**—1½″, 11 ga. barbed roofing nail, 7/16″ head, engaging 2 strands on a rib	6″
steel studs, channels or rods	No. 18 ga. tie wire	6″
nailing studs or channels	Nail or staple as recommended by manufacturer of the member	6″

3. PYROBAR Gypsum Partition Tile

description

PYROBAR is a precast, kiln dried gypsum tile for building non-load bearing fireproof partitions. It is made in 12″ x 30″ size, in four thicknesses with indented surfaces, in hollow and solid types as follows:

2″ Solid for column and vent shaft fireproofing
3″ Solid, 3″ Hollow, 4″ Hollow and 6″ Hollow, all for partitions and column fireproofing

Complies with ASTM C52 and Federal Specification SS-T-316.

function

Fire Resistance—PYROBAR provides the greatest fire protection per inch of thickness of any commercial partition assembly; fire ratings up to 4 hours (see USG Construction Selector).

Lightweight—30% to 50% lighter than other commonly used masonry units.

Economy—Fewer joints than with smaller masonry units; machine moulded units lay accurately to form level surface, require less plaster and mortar than other types; easily cut, handled and maintained; ideal for tenant office renovations.

Plaster Bond—PYROBAR is the most compatible masonry plaster base for gypsum basecoat plasters.

Sound Resistance—Excellent sound transmission loss ratings when plastered two sides, further improved by resilient lath and plaster facing on one side (see USG Construction Selector).

For details of use in partition systems, see USG Folders a-1157 and a-1167.

limitations

1. For use only in non-load bearing constructions.

2. Portland cement and lime mortars do not bond adequately with PYROBAR. RED TOP Partition Tile Cement should be used.

3. Portland cement or lime plasters cannot be used over PYROBAR. RED TOP Gypsum Plaster should be used.

4. PYROBAR must be protected by a continuous coating of asphaltic material prior to any contact of wet flooring or base material with the face of the tile.

PYROBAR use	finished partition thickness	wt. psf	limiting height
2″ solid, unplastered	2″	11	—
2″ solid, plaster 1 side	2⅝″	16	—
3″ solid, unplastered	3″	16	13′
3″ solid, plaster 1 side	3⅝″	21	13′
3″ hollow, unplastered	3″	11	13′
3″ hollow, plaster 1 side	3⅝″	16	13′
3″ hollow, plaster 2 sides	4¼″	23	13′
4″ hollow, plaster 1 side	4⅝″	20	17′
4″ hollow, plaster 2 sides	5¼″	26	17′
6″ hollow, plaster 2 sides	7¼″	33	30′
3″ hollow, res. clip 1 side, M/L-Pl.	5¼″	25	13′
4″ hollow, res. clip 1 side, M/L-Pl.	6¼″	30	17′
3″ hollow, res. clip 1 side, R/L-Pl.	5″	23	13′

PYROBAR Partition Tile

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4. USG Corner Reinforcements, Screeds and Control Joints

description

USG Corner Beads and Screeds, made from top-quality 26-ga. galvanized steel, enjoy the industry's top acceptance because of their dependability and continual improvement in design. Corner beads are available in 7′, 8′, 9′, 10′ and 12′ lengths, screeds in 10′ lengths, casing beads (24-ga. galv. steel) in 7′, 8′ and 10′ lengths.

function

Protection—USG Corner Beads should be used on all external plaster corners to provide plaster protection, true and straight lines at corners, and grounds for plastering; USG Casing Beads around wall openings and at intersections of plaster with other finishes.

Control—USG Screeds are used to divide different types of plaster finishes and as a separation between plaster and a cement base, or as a permanent incombustible screed to control plaster thickness and alignment beneath the wood or other rigid base trim.

1-A Expanded Corner Bead has wide expanded flanges that are easily flexed. Preferred for irregular corners. Provides increased reinforcement close to nose of bead.

4-A Flexible Corner Bead is a general purpose corner bead, economical and most generally used. By snipping flanges, this bead may be bent to any curved design (for archways, telephone niches, etc.). Can be secured to corners with 9-A Corner Bead Clips attached to flanges.

4-R Expanded Corner Bead is an outstanding new item with small nose and totally expanded 2″ wide flanges designed to increase plaster keys and minimize corner cracking. A general purpose bead, suitable for straight or arched corners.

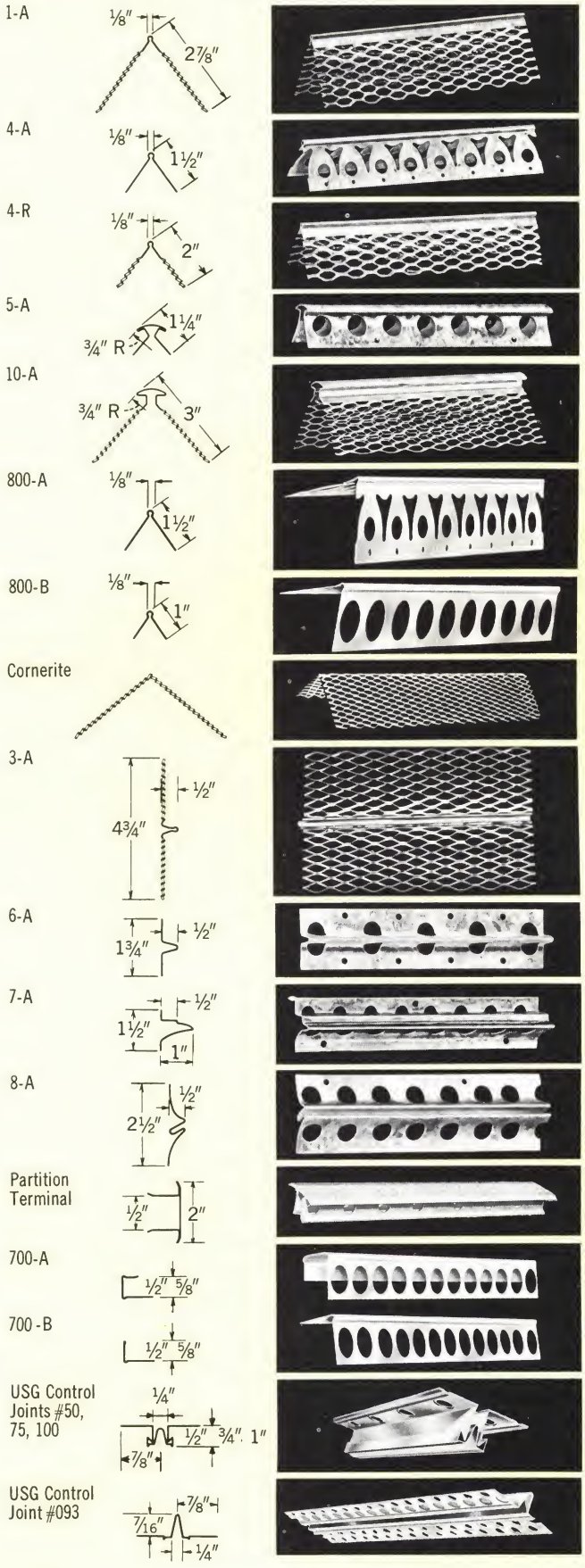
5-A Bull Nose Corner Bead is ¾″ radius bead with short flange. Used for rounded corners. Can be secured with No. 9-A Corner Bead Clips attached to flanges, where wide nailing flanges are required.

10-A Expanded Bull Nose Corner Bead is a bull nose bead similar to above, but with 2½″ wide expanded flanges. Especially suitable on irregular corners.

800-A Corner Bead provides for a plaster thickness up to ⅛″. For use with IMPERIAL Plaster basecoats in two-coat systems (see USG Folders a-1147, a-1337).

800-B Corner Bead gives 1/16″ grounds for thin-coat IMPERIAL Plaster finishes in the single-coat system (see USG Folders a-1147, a-1337).

Cornerite and Striplath are strips of painted copper alloy Diamond Mesh lath used as reinforcement. Selv-edge **Cornerite,** bent lengthwise in the center to form a 100° angle, should be used in all internal plaster angles where metal lath is not lapped or carried around; over non-ferrous lath anchored to the lath; and over internal angles of masonry constructions. Its use is optional in Resilient ROCKLATH lathing systems (see USG Folders a-1156, a-1187); also used in the "Floating Angle" method of applying gypsum lath to wood framing members in order to reduce plaster cracking (see USG Folder a-1377). **Sizes:** 2″ x 2″ x 96″ and 3″ x 3″ x 96″. **Striplath** is a similar flat strip, used as a plaster reinforcement over joints of non-metallic lathing bases and where dissimilar bases join; also to span pipe chases. **Sizes:** 4″ x 96″ and 6″ x 96″.



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3-A Expanded Base Screed is a flush type ½″ ground (job shimmed for ¾″ grounds) with wide flexible expanded flanges for added reinforcement. Used as a dividing strip between plaster and flush portland cement base.

6-A Plain Base Screed is a flush type ½″ ground (job shimmed for ¾″ grounds), used as a straight divider strip between different types plaster, as between gypsum and portland cement.

7-A Curved Point Base Screed is a dividing strip for use between plaster surface and projecting portland cement base. Upper ground is ½″, bottom ground is 1″.

8-A Picture Mould provides a concealed mould, attached to lath and plastered flush to the notch opening. Grounds ½″ (job shimmed for ¾″ grounds).

USG 2″ Partition Terminals are used as vertical terminals for 2″ solid metal lath or ROCKLATH* partitions. Can be used as a ceiling runner where 2″ solid partitions abut an unplastered surface. Formed of 24-ga. galvanized and bonderized steel. **Lengths:** 8′ and 10′.

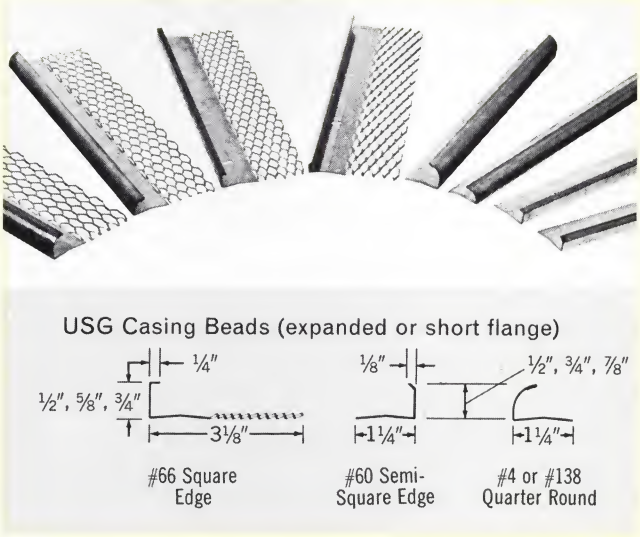
USG Metal Trim comes in two styles to provide neat edge protection for thin-coat plastering applications at cased openings and ceiling or wall intersections. Made of galvanized steel, both have perforated flanges to strengthen the plaster bond. They fit over edges of IMPERIAL plaster base, and provide grounds for IMPERIAL Plasters. **No. 700-A** is channel-type casing nailed to door or window buck. **No. 700-B** is an angle edge trim used at junction of plaster base with rough concrete or masonry ceiling—attached by stapling when used with USG metal studs.

USG Control Joint is a revolutionary new product designed to relieve stresses of both expansion and contraction in large plastered areas. Made from roll-formed zinc, it is resistant to corrosion in both interior and exterior uses with gypsum or portland cement plaster. An open slot, ¼″ wide and ½″ deep, is protected with plastic tape which is removed after plastering is completed. The short flanges are perforated for keying and attachment by wire-tying to metal lath or by stapling to gypsum lath. Thus the plaster is key-locked to the control joint, which not only provides plastering grounds but can also be used to create decorative panel designs. **Limitation:** where sound and/or fire ratings are prime considerations, adequate protection must be provided behind the control joint. **Sizes and grounds: No. 50,** ½″; **No. 75,** ¾″; **No. 100,** 1″ (for uses such as exterior stucco, acoustical plaster work)—all in 10′ lengths. For maximum spacing and specifications, see pertinent USG Systems Folders.

USG Control Joint No. 093 applies the same functions of the regular control joint (above) to thin-coat installations employing IMPERIAL Plaster Finish over IMPERIAL Plaster Base. Made of zinc, with $\frac{3}{32}$″ ground dimension and a tape-protected ¼″ opening $\frac{7}{16}$″ deep. Used from floor to ceiling in long partition runs, and from door header to ceiling. Also recommended for repair of existing plastered masonry. **Lengths:** 8′ and 10′.

IMPERIAL Tape is a special 2½″ wide glass fiber lino-weave tape, staple-applied to conceal and reinforce joints of large-size IMPERIAL and RED TOP Radiant Heat plaster bases prior to finishing with the thin-coat plasters of those systems. Open weave of tape allows rapid air escape during plaster embedding; highly crack resistant.

USG Casing Beads are used as a plaster stop and as exposed trim around window and door openings; also recommended at junction or intersection of plaster and other wall or ceiling



finishes. May be used with USG metal lath, ROCKLATH* gypsum plaster base, or masonry construction. In order to insure proper grounds for plastering, ¾″ casing beads are recommended for use with metal lath, ⅝″ beads with all masonry units, ⅞″ beads when the flange is applied *under* ROCKLATH plaster base, ½″ beads when the flange is applied *over* ROCKLATH. Styles available:

casing bead	style	flange	grounds
#4	quarter rd.	expanded	(½″, ¾)
#138	quarter rd.	short	(½″, ¾, ⅞)
#60	semi-square	expanded	(½″, ¾)
		short	(½″, ¾, ⅞)
#66	square	expanded	(½″, ¾, ⅝)
		short	(½″, ¾, ⅞)

5. USG Lath Attachment Accessories

description

A complete line of specially formed steel clips and self-drilling steel screws is available to provide positive attachment and rapid erection of USG gypsum plaster bases and metal lath. Variations are designed for use with ten different USG partition and ceiling systems. Erection and specification are covered in individual USG Systems Folders.

function

1. BRIDJOINT Clips provide a rigid alignment of ROCKLATH plaster base where ends of lath do not fall on structural members, thus adding crack resistance at vulnerable points; BRACE-TITE* Clips, of special wire, attach ⅜″ ROCKLATH to metal ceiling grillages, exterior wall and beam furring channels, and TRUSSTEEL* Studs in partitions; TRUS-LOK* Clips attach ⅜″ ROCKLATH to TRUSSTEEL Studs; USG Bracing Clips and Ceiling Runner Clips attach Long Length ROCKLATH to channels and runners.

2. USG Resilient Clips provide a non-rigid or floating attachment to ⅜″ ROCKLATH plaster base and USG Metal Lath to the structural frame, thus affording increased protection against plaster cracking due to structural movement, and increased sound resistance.

3. USG Screws are recommended for attachment of IMPERIAL and RED TOP Radiant Heat Plaster Bases to metal or wood framing; are also an alternative to MS-1 Clips in attachment of ROCKLATH to USG Metal Studs.

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limitations

1. Three-coat plastering is required on resiliently attached ROCKLATH ceilings.

2. Perforated ROCKLATH Plaster Base is not recommended for resilient attachment.

3. When used with BRACE-TITE* Clips, maximum spacing of cold rolled channels and TRUSSTEEL* Studs is 16″ o.c.

BRIDJOINT* Field Clip B-1 is used to support and align end joints of ROCKLATH which do not fall opposite structural members; sizes for both ⅜″ and ½″ lath.

BRIDJOINT Corner Clip B-2 is used in conjunction with B-1 clips to eliminate nailing in corners and angles; also when ceilings are resilient and walls nailed direct and vice versa. For ⅜″ ROCKLATH only.

BRACE-TITE Field Clip BT-1 is used for suspended ceilings, exterior wall and beam furring and hollow pipe chase partitions. Designed to provide support across the full width of the lath; improved for easy installation. For use with standard ¾″ cold rolled channels.

BRACE-TITE Starter Clip BT-1 is used in conjunction with BT-1 field clip to start first course of lath.

TRUS-LOK* Field Clip TL-1 is designed for attaching ⅜″ ROCKLATH to TRUSSTEEL Studs.

TRUS-LOK Starter Clip TL-2 is used in conjunction with TL-1 clips, MS-1 clips and runner track to start first course of lath.

TRUS-LOK Drive-In Clip is used to anchor (1) bottom course of lath in direct attachment to TRUSSTEEL Studs or USG Metal Studs, and (2) top course of lath in partitions to underside of monolithic concrete flat slab or concrete joist filler construction.

Field Clip MS-1 is a new device providing quick direct attachment of ⅜″ ROCKLATH to channel-type USG Metal Studs. Clip is slipped behind stud flange and down over lath.

USG Bracing Clip is provided for attaching ¾″ channels to ½″ long length ROCKLATH as temporary braces in 2″ solid ROCKLATH and plaster partition construction (see USG Folder a-1036).

Ceiling Runner Clips are used for attaching ½″ long length ROCKLATH to "L" shaped ceiling runners.

Resilient Clip TR-1 attaches ⅜″ ROCKLATH to TRUSSTEEL Studs spaced 16″ o.c., furs lath ⅜″ from stud face.

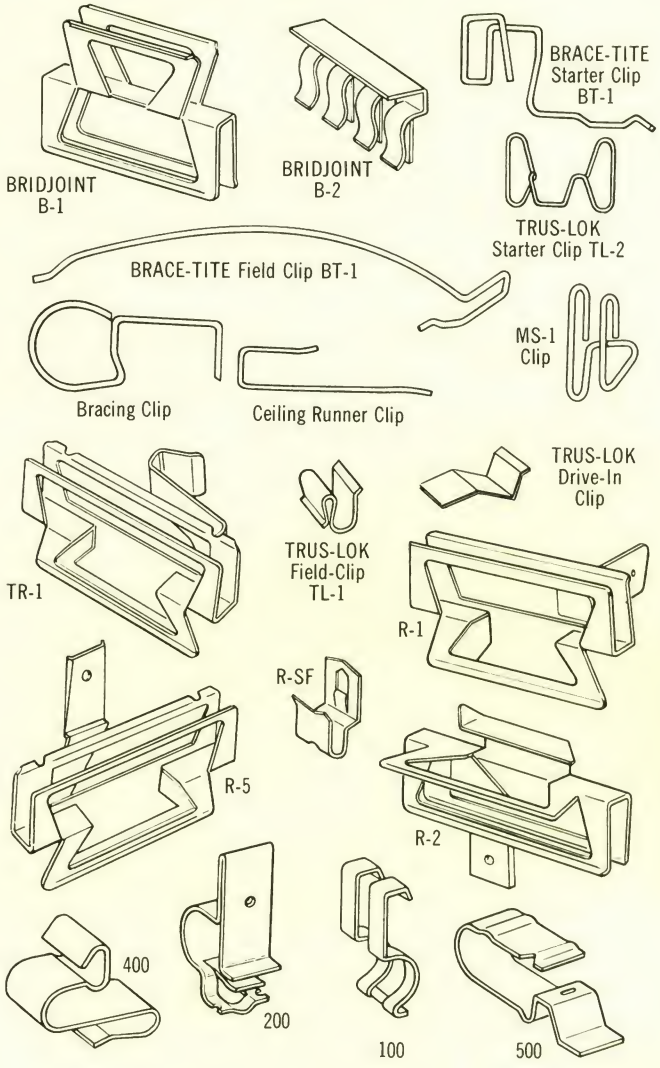
Resilient Starter-Finisher Clip R-SF is used with starting and last courses of resiliently attached ROCKLATH Plaster Base on wood studs or TRUSSTEEL Stud snap-in runner track.

Resilient Clip R-1, for wood studs or joists spaced 16″ o.c., is attached by nailing with 13-ga., 1⅛″ lathing nail. ROCKLATH is floated ⅜″ free of framing members and held in place by the prongs of the clip.

Resilient Clip R-2 is for internal angles of wood frame construction when both surfaces are resiliently furred. Furs lath ⅜″ from framing.

Resilient Clip R-5 is for masonry walls or face attachment over sound deadening board. ROCKLATH is resiliently furred ½″ from face.

Resilient Clip No. 100 is used to resiliently furr ¾″ cold rolled channels from 1½″ runner channels in suspended ceiling construction. Lath is furred 1¼″ from channel.



Resilient Clip No. 200 attaches ½″ pencil rods to wood studs or joists, is spaced not over 12″ o.c. for ceilings or 16″ o.c. for sidewalls. Attached with 13-ga. 1⅛″ lathing nails, metal lath thus is floated ½″ free of framing members when lath is wire tied to rods. On walls, rods are snapped into clips; on ceilings, clips are slipped onto rods.

Resilient Clip No. 400 is snapped in place, 16″ o.c., over the outer flanges of TRUSSTEEL Studs. ¼″ pencil rod is snapped into the protruding tongue of the resilient clip, and metal lath wire tied in place ½″ from stud face.

Resilient Clip No. 500 is for masonry walls. Nailed or stapled in place over PYROBAR* Gypsum Partition Tile, concrete blocks, clay tile or brick attachment. Metal lath is resiliently furred out ⅞″ from the face of masonry by wire tying to ¾″ channels wire tied inside protruding tongue of clip.

USG Screws are the recommended means of attachment of large-size IMPERIAL and RED TOP Radiant Heat gypsum lath, as well as of ROCKLATH Plaster Base in certain applications. Twelve different self-drilling, self-tapping steel screws can

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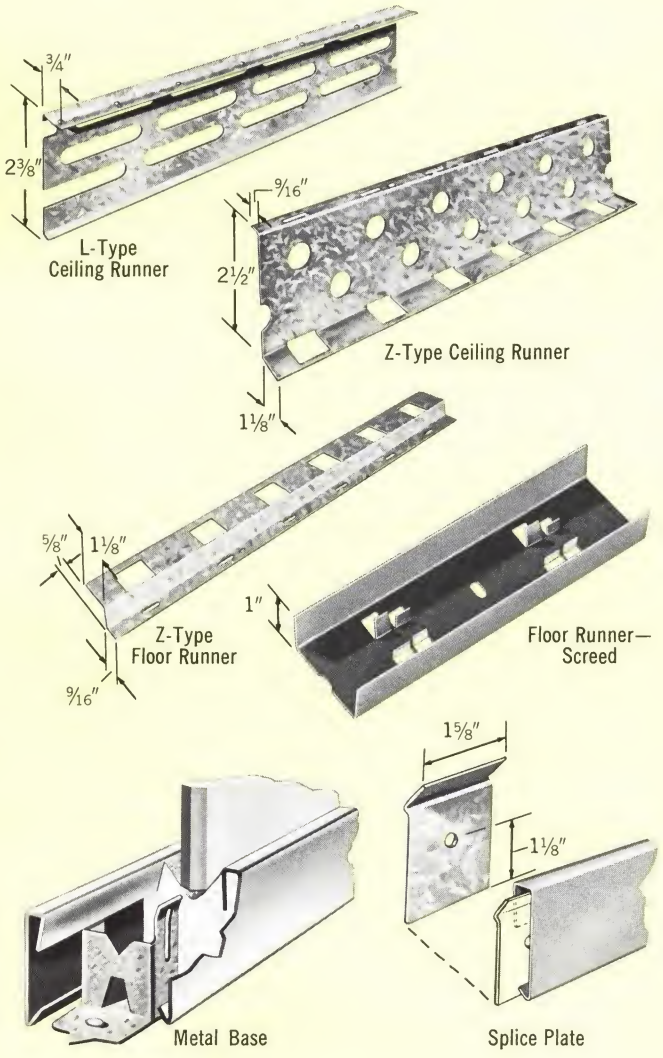
be used in plastering systems, applied by power-driven screw gun. Applications are listed below.

USG Screws—size & type	fastening applications
¾" Type S—Bugle Head	Single-layer ⅜" ROCKLATH to USG Metal Studs and Furring Channels
1", 1⅝" and 1⅝" Type S—Bugle Head	Single and double-layer IMPERIAL Base to steel studs, metal furring; (1" screw only) IMPERIAL and Radiant Heat Bases to RC-1 Resilient Channel
1¼", 1⅞" & 2½" Type S—Bugle Head	Core units and face-layer IMPERIAL Base to metal runners in 2" Solid and Double-Solid Partitions
1⅝" & 2¼" Type S—Trim Head	Wood trim over single and double-layer IMPERIAL Base to steel studs
⅜" Type S-12—Pan Head	Metal door frame to steel studs; steel studs to metal runners
1¼" Type W—Bugle Head	Single-Layer IMPERIAL and Radiant Heat Bases to wood framing; RC-1 Channels to wood framing
1½" Type G—Bugle Head	Face-layer IMPERIAL Base to base-layer IMPERIAL Base or gypsum coreboard in Laminated and Solid Partitions



6. USG Runners, Metal Bases and Accessories

description

USG runners, metal base and base clips provide secure anchorage, alignment and installation economies for various plaster partitions and wall furring assemblies. They are made from cold rolled steel in standard 8′ and 10′ lengths.

function

Labor-Saving—USG runners and base clips are pre-punched for quick attachment; metal base has snap-on feature for rapid positioning with almost any type of wall or partition, plus an automatic and independent adjustment to any rough or finished floor.

Versatile—Design of USG Metal Base permits ready forming of internal and external corners on the job.

Safety—These all-steel components add no combustible materials to the construction, and protect the top and base of partition.

USG Ceiling and Floor Runners, of 26-ga. galvanized steel, three models: **L-Type Ceiling Runner** providing top anchorage for studless metal lath or ROCKLATH* solid plaster partitions, 8′ lengths; **Z-Type Ceiling Runner** to anchor and align ¾" channels in either solid partition construction or exterior wall furring, 10′ lengths; and **Z-Type Floor Runner** to secure base of ¾" channels in solid partitions and exterior wall furring, 10′ lengths.

USG Floor Runner and Screed is a one-piece, channel-type combination unit used to anchor 2" solid lath and plaster partitions to concrete floors. Can be cut with a hacksaw or tin snips; fastens to floor with concrete stub nails or rawl drives. Base requires no grouting, except with studless metal lath partitions. One-inch legs provide an excellent ground establishing the 2" thickness of the partition. Designed for covering with asphalt or rubber base, and may be installed over a 2" wide wood strip where nailing for wood base is required. Formed of 20-ga. cold rolled steel painted black, 10′ lengths. Also available with center guides positioned for use with ½" Long Length ROCKLATH plaster base.

USG Metal Base makes possible flush installation of a 2½" high 18-ga. face plate adaptable to all plaster partitions and furred exterior walls, by means of specially formed steel clips.

A strong, rugged base goes into place with minimum labor through snap-on application to the double base clip used in 2" solid plaster partitions or to the single base clip and combination stud base clip (below) used with hollow partitions or furred walls. The ears of the floor clips engage the top flange of the face plates, automatically adjusting the face plates to uneven or irregular floors. The face plates are easily mitered or notched and bent to form inside and outside corners, and are butted and spliced for continuous uninterrupted runs from one type of wall construction to another.

As a floor runner with solid partitions, the base is grouted full with sanded plaster and raked out in a "V" to receive the Long Length ROCKLATH. Primed with a rust inhibitive paint; 10′ lengths.

USG Metal Base Splice Plates join the metal base face plates together quickly and in proper alignment.

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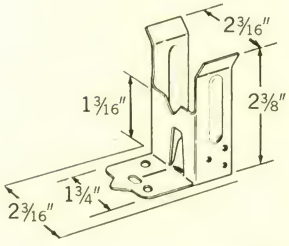
USG Double Base Clip is designed to secure a solid plaster partition to the floor and provide attachment of the USG 2½″ Metal Base Face Plate to both sides. Available for the 2″ and 2¼″ Solid Partitions.

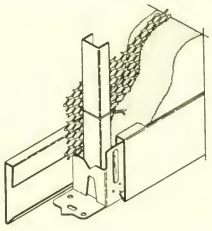
USG Single Base Clip is used primarily as an attachment for the USG Metal Base Face Plate for furred walls or partition systems of varying widths.

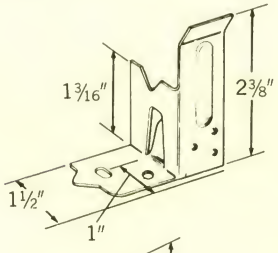
USG Masonry Base Clip is designed for attachment of the USG Metal Base Face Plate to masonry, providing a ⅝″ plaster ground.

USG Stud Base Clip attaches the USG Metal Base Face Plate to studs. Clips may be wire tied, nailed or screwed to the studs.

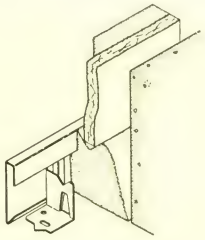


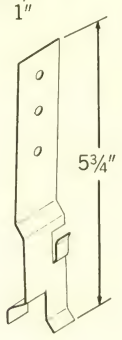
Double Base Clip



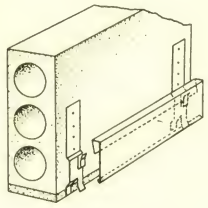


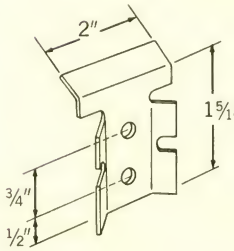
Single Base Clip



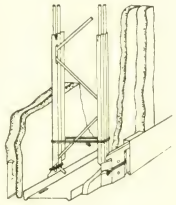


Masonry Base Clip





Stud Base Clip



7. USG Structural Accessories

description

USG leads the industry in the development and acceptance of structural components for plastering systems. All are incombustible, made from galvanized steel or rods. Included are two non-load bearing studs of the truss and channel types, complete with runner tracks, shoes and screws as needed; hat-shaped and U-shaped furring and lathing channels, and an adjustable wall furring bracket.

function

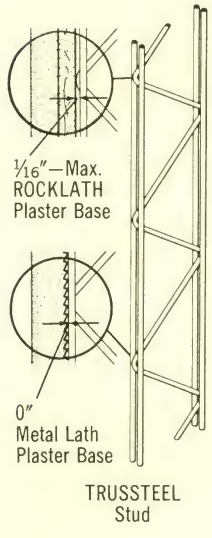
Designed for use with both USG gypsum plaster bases and metal lath, these accessories provide established fire ratings and improved sound transmission loss (see USG Construction Selector). Other advantages are light weight, low material cost and quick erection, superior strength, and versatility in meeting job requirements.

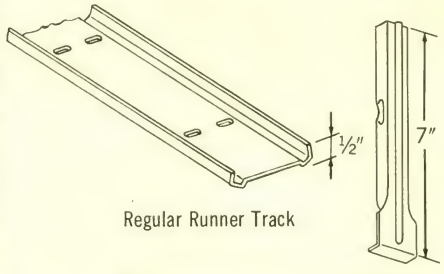
Details, specifications, limiting heights and spacing are covered in pertinent USG Systems Folders.

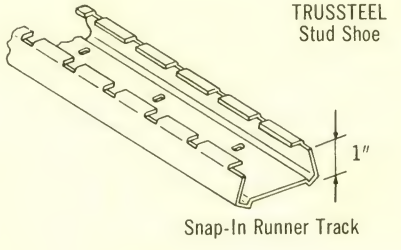
TRUSSTEEL Studs are the original open truss design studs for the erection of hollow, fire-resistant partitions. The strongest non-load bearing studs on the market, they are formed from cold drawn No. 7 ga. steel wire rods with a tensile strength of 90,000 psi—substantially higher than the hot rolled sheets from which pressed metal and edge angle studs are formed.

Made with a continuous diagonal wire web welded to double wire flanges, TRUSSTEEL Studs are fabricated in five stud widths: 1⅝″, 2½″, 3¼″, 4″ and 6″, mill cut to job lengths. The open-web design readily accommodates pipes, conduits and ducts (see table below) without impairing the strength of the partition assembly. This engineered member, together with its accessories (below) provides a framework for easy direct or resilient attachment of metal lath or ROCKLATH plaster base—the best sound isolation partition systems in the industry and the most economical.

USG Snap-In Runner Track is used in anchoring the TRUSSTEEL Stud partition to the floor. Attachment of stud to







*Reg. U.S. Pat. Off.

track is by a snap-in feature, eliminating the need for stud shoes. When the track serves as a ceiling runner, however, stud shoes are used if a fire rating is required. Available for all except the 6″ width of TRUSSTEEL Studs; 8′ lengths.

USG Regular Runner Track is used in conjunction with TRUSSTEEL* stud shoes to anchor the partition to the floor or ceiling, particularly where there is considerable floor-to-ceiling height variation. Available for all widths of TRUSSTEEL Studs; 8′ lengths. Where top track is attached to suspended or furred framing, 1″ tapping screws are used to anchor top course of lath into web wires of studs.

TRUSSTEEL Stud Shoes 7″ long, are used for connecting studs to regular track and permit up to a 4″ adjustment in partition height.

Design Data—TRUSSTEEL Studs

stud size—(widths)	1⅝″	2½″	3¼″	4″	6″
weight—(lbs. per 1000 ft.)	435	440	460	470	520
deflection**	.355″	.168″	.117″	.094″	.072″
gauge	–7 ga. (diameter .177) chords and diagonals				
tensile strength	85,000 psi—yield point				
percent of open area	67%	79%	84%	87%	91%

**Deflections of TRUSSTEEL Studs with 100 lb. concentrated load in a 5-ft. span are below the maximum allowable deflections of .20″ for 2½″ studs, .15″ for 3¼″ studs, and .10″ for 4″ and wider studs specified in the requirements of the United States Corps of Engineers, General Services Administration, and Veterans Administration.

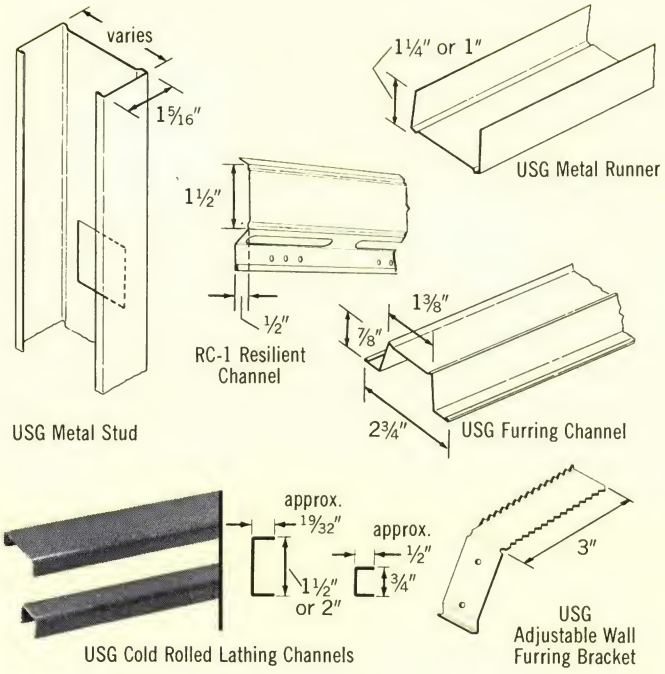
Structural Properties—TRUSSTEEL Studs

stud size	major axis			minor axis		
	I_x in⁴	S_x in³	r in	I_y in⁴	S_y in³	r_y in
1⅝″	.0518	.0637	0.725	.0033	.0123	.1824
2½″	.1330	.1064	1.162	.0033	.0123	.1824
3¼″	.2325	.1431	1.537	.0033	.0123	.1824
4″	.3611	.1806	1.916	.0033	.0123	.1824
6″	.8345	.2781	2.912	.0033	.0123	.1824

USG Metal Studs are channel-type members in four stud widths—1⅝″, 2½″, 3⅝″ and 4″—roll formed from 25-ga. electro-galvanized steel (or hot-dipped galvanized steel, made with keyhole slots, available in selected markets). The secure rigid screw or clip attachment of the plaster base utilizes the full structural contribution of the lath and plaster membrane. Limited chaseways are provided by cutouts located at 24″ intervals. Studs may be overlapped and spliced by means of screws or wire ties. Partitions using these studs are low in cost and have excellent sound and fire resistance characteristics. Structural properties and limitations are as follows:

USG stud designation	width	stud spacing	max. height(1) (2)	max. height(1) (3)	max. height(1) (4)	structural properties I in.⁴ x-x	structural properties S in.³ x-x	structural properties R in. x-x
No. 158	1⅝″	12″ 16″ 24″	10′9″ 10′3″ 9′0″	11′6″ 10′0″ 8′0″	8′0″ 7′0″ 5′9″	.046	.0489	.673
No. 212	2½″	12″ 16″ 24″	14′9″ 14′0″ 12′0″	15′3″ 13′3″ 10′9″	10′9″ 9′3″ 7′6″	.122	.0862	1.010
No. 358	3⅝″	12″ 16″ 24″	20′0″ 19′0″ 16′0″	19′6″ 17′0″ 13′9″	13′9″ 12′0″ 9′9″	.284	.142	1.411
No. 400	4″	12″ 16″ 24″	21′6″ 20′3″ 17′3″	20′3″ 17′9″ 14′6″	14′3″ 12′6″ 10′3″	.334	.156	1.528

(1) Height is not limited by length of unsupported run or size and location of openings.
(2) Max. height allowable where no superimposed load is applied perpendicular to partition.
(3) Max. height allowable where a 5 psf uniform load is applied perpendicular to partition.
(4) Max. height allowable where a 10 psf uniform load is applied perpendicular to partition.



USG Metal Runner is supplied in the four stud widths for use at floor and ceiling. The 25-ga. steel track also functions as a header over metal door and borrowed light frames. At the floor, the track may be used in combination with the USG 2½″ Metal Base and Stud Base Clip.

USG Furring Channel is a roll formed hat-shaped section of 25-ga. hot dipped galvanized steel. It may be clip (USG Furring Clip) attached to the 1½″ main carrying channel and spaced 16″ o.c. for the economical screw attachment (below) of ROCKLATH* as a base for either adhesive attachment of acoustical tile or a basecoat plaster; 4-foot span. The Metal Furring Channel also provides an incombustible furring for exterior walls and may be spaced up to 24″ o.c. for screw attachment of ROCKLATH plaster base. Face width 1⅜″, depth ⅞″.

RC-1 SHEETROCK Resilient Channel is a 25-ga. electro-galvanized steel channel for resilient attachment of IMPERIAL and RED TOP Radiant Heat Plaster Bases to wood framing. This is one of most effective, lowest cost methods of improving sound transmission loss through partitions and ceilings. Flange is pre-punched for screw fastening to framing by USG 1¼″ Screw Type W. Base is attached to channel by USG 1″ Screw Type S. Channel is 2¾″ wide x ½″ in depth.

USG Adjustable Wall Furring Brackets are used for attaching ¾″ furring channels to exterior masonry walls. Made of 20-ga. galvanized steel with serrated edges, they are wire-tied to horizontal stiffeners, 24″ o.c., in braced furring systems. Normal furring depth is ¼″ to 2¼″; with USG Furring Channels, depth is increased by ⅞″.

USG Lathing Channels are cold rolled from 16-ga. steel, black asphaltum painted; used for furring, suspended ceilings, partitions, and ornamental lathing. **Sizes:** ¾″, 1½″, 2″. **Lengths:** 16′ and 20′.

*Reg. U.S. Pat. Off.

Size and Spacing of Hangers

size and type	max. ceiling area supported per hanger
No. 9 ga. galvanized wire	12½ sq. ft.
No. 8 ga. galvanized wire	16 sq. ft.
3/16″ mild steel rod (1) (2)	20 sq. ft.
¼″ mild steel rod (1) (2)	22.2 sq. ft.
3/16″ x 1″ mild steel flat (1) (2)	25 sq. ft.

(1) Galvanized rods and rust inhibitive painted or galvanized straps recommended where severe moisture conditions may occur. (2) Not manufactured or supplied by United States Gypsum Company.

Size and Spacing of Main Runners

cold rolled channel—size	approx. wt./ 1000 ft. (lbs.)	max. spacing of hangers along runners	max. c. to c. spacing of runners
¾″	300	2′	3′
¾″	300	3′ (1)	2′-3″
1½″	500	3′	4′
1½″	500	3′-6″	3′-6″
1½″	500	4′	3′
2″	590	5′	3′-6″
2″	590	6′	2′-6″
2″	590	7′	2′

(1) For concrete joist construction only.

Size and Spacing of Cross Furring Members

spacing of supports	channel size	approx. wt./ 1000 ft. (lbs.)	max. c. to c. spacing of cross furring
3′-0″	¾″	300	24″
3′-6″	¾″	300	19″
4′-0″	¾″	300	16″

general lathing specifications

notes to architect

The following comments and recommendations cover the basic specifications for normal job requirements, and are intended as minimum guide specifications which can be adapted to specific projects and conditions.

Detailed specifications on the various systems are covered in pertinent USG Systems Folders. Other related job conditions should be covered in the plans, details, or specifications.

It is not intended that these specifications shall cover every possible design or job condition, but rather to assist in the preparation of specifications applicable to a given project.

I. scope—Outline the extent of work included.

II. general provisions—In cold weather, the building shall be glazed and heated before lathing.

III. materials—All materials herein specified shall be manufactured by the United States Gypsum Company.

a. Plaster Base shall be:

(ROCKLATH gypsum plaster base (thickness)—Plain, Perforated, FIRECODE*, Long Length, Insulating.)

(IMPERIAL plaster base (thickness)—Plain, Type X.) (Specify only with IMPERIAL plaster, #800 corner bead, IMPERIAL joint reinforcement tape attached with flattened galv. rosin coated staples with 3/8″ legs.)

(RED TOP Radiant Heat plaster base (thickness) (Specify only with RED TOP Radiant Heat plaster, IMPERIAL joint reinforcement tap) attached with flattened galv. rosin coated staples with 3/8″ legs.

(USG Metal Lath (weight)—Junior Diamond Mesh, Z-Riblath, 3/8″ Riblath, ¾″ Riblath, Expanded Metal Stuccomesh.)

(PYROBAR* gypsum partition tile (thickness)—Hollow, Solid, used with RED TOP Partition Tile Cement.)

b. Reinforcement shall be: (USG 1-A, 4-A, 4-R, 5-A, 10-A, #800-A, #800-B Corner Bead, Cornerite, Striplath.)

c. Screed shall be: (USG 3-A, 6-A or 7-A Base Screed; 8-A Picture Mould.)

d. Control Joint shall be: USG Control Joint (#50, #75, #100 or #093).

e. Casing Bead shall be: (size) #4, #138, #60 or #66 USG Casing Bead (or USG Metal Trim 700-A and 700-B).

f. Lath Attachment Clips shall be: (BRIDJOINT* Clip B-1 or B-2; BRACE-TITE* Field Clip or Starter Clip BT-1; TRUS-LOK* Field Clip TL-1, Starter Clip TL-2, Drive-In Clip TL; Field Clip MS-1; USG Bracing Clip; USG Ceiling Runner Clip; USG Resilient Clip TR-1, R-SF, R-1, R-2, R-5, #100, #200, #400, or #500).

g. Screws shall be: (¾″, 1″, 1¼″, 1 5/16″, 1⅝″, 1⅞″ or 2½″ USG Type S, Bugle Head) (1⅝″, or 2¼″ USG Type S, Trim Head) (⅜″ USG Type S, Pan Head) (⅜″ USG Type S-12) (1¼″ USG Type W) (1½″ USG Type G.)

h. Runners shall be: (USG L-Type or Z-Type Ceiling Runner; Z-Type Floor Runner; Combination Floor Runner-Screed.)

i. Metal Base shall be: USG Metal Base.

j. Base Clips shall be: (USG Double Base, Single Base, Masonry Base, Stud Base.)

k. Metal Studs shall be: (size) (TRUSSTEEL Studs, used with USG Snap-In or Regular Runner Track, TRUSSTEEL Stud Shoes) (USG Metal Studs, used with USG Metal Runner, USG Metal Furring Channel).

l. Furring Brackets shall be: USG Adjustable Wall Furring Brackets.

m. Lathing Channels shall be: USG Lathing Channels.

n. Resilient Channels shall be: RC-1 SHEETROCK Resilient Channels.

o. Partition Terminals shall be: USG 2″ Partition Terminal.

IV. grounds—Grounds shall be set to provide the following minimum thickness of plaster over face of plaster base, including 1/16″ finish:

1/16″ to 3/32″ on IMPERIAL plaster base
¼″ on RED TOP Radiant Heat plaster base
½″ on ROCKLATH plaster base
⅝″ on metal lath, measured from face of lath
⅝″ on masonry base
¾″ on Long Length ROCKLATH used for 2″ Solid Partitions or Exterior Wall Furring

Note: Greater thicknesses may be required for certain fire-rated constructions.

V. attachment of ROCKLATH plaster base

a. ROCKLATH Plaster Base shall be applied face out with the long dimension at right angles to the framing members. All joints shall be butted together and the lath shall be cut accurately and fitted neatly around all electrical outlets, openings, etc. The end joints shall be staggered in successive courses.

b. Where the type framing or spacing of framing does not allow for secure attachment of butt ends to a framing member, apply ROCKLATH Plaster Base with the long dimension across the framing members, with end joints staggered in successive courses. Ends of lath shall fall between framing members, and be aligned and engaged using the BRIDJOINT Clip.

c. Apply Cornerite to all interior angles. Staple to the lath only.

VI. attachment of IMPERIAL plaster base

a. IMPERIAL Plaster Base shall be applied either horizontally or vertically; if vertically, all ends and edges shall occur over framing members. Maximum practical lengths of the plaster base shall be used, applied first to ceilings and then to walls. All joints shall be neatly butted, but not forced into place. (For special ceiling and wall applications, see USG Folders a-1147 and a-1337.)

*Reg. U.S. Pat. Off.

b. Nailing shall proceed from central portion of base toward ends and edges, at spacing of (see table, Page 2). Base shall be nailed tightly, with nailheads set flush but not breaking the paper. If necessary, double nailing shall be used. At exterior corners, one board shall overlap the second with flush fit.

c. Tape shall be stapled over full length of all joints but shall not overlap at intersections; corner bead shall be applied to all external angles; both attached and spaced according to manufacturer's directions. Prior to application of IMPERIAL Plaster, joints shall be pre-embedded and allowed to set.

d. IMPERIAL Plaster Base shall be protected from contamination or overspray of materials containing lime or casein additives.

VII. attachment of RED TOP Radiant Heat plaster base

(See USG Folder b-1517)

VIII. attachment of USG metal lath

a. All metal lath shall be applied with the long dimension of the sheet across the supports. Riblath shall be applied with the rib projecting against the supports.

The ends of all lath shall be lapped not less than 1″. If end laps are made between supports they shall be adequately tied with 18-ga. tie wire. The sides of diamond mesh lath shall be lapped not less than ½″. Riblath shall be lapped by nesting the outside ribs.

Wherever possible, end of lath in adjacent courses shall be staggered. Metal lath shall be secured to all supports at intervals not exceeding 6″.

b. At all interior angles, metal lath shall be formed into the corners and carried out onto the abutting surface, and adequately secured.

IX. erection of PYROBAR gypsum partition tile

a. Sand shall be clean and sharp, complying with ASTM C35.

b. All mortar shall be mixed in proportions of 1 part RED TOP Partition Tile Cement to 3 parts sand, by weight. Mortar shall not be retempered.

c. After door frames are erected and rough plumbing and electrci conduit are in place, the first course of PYROBAR Partition Tile shall be laid with core holes horizontal by bedding in mortar to a true and straight line according to partition layout as shown on plans. Succeeding courses shall be laid to a line in ½″ thick full mortar beds uniformly level in each course. Vertical joints shall be staggered and head joints shall be filled with ½″ of mortar. Cut all joints flush. Use of broken tile shall be kept to a minimum. Chinks and crevices shall be slushed full with mortar.

d. Partitions shall be wedged tightly at ceiling with skew cut tile corners every third tile. Joints between tile and ceiling shall be slushed full with mortar.

e. Steel door frames and borrowed light openings shall be securely anchored. Lintels shall be provided as shown.

For specifications and details covering partitions, wall furring, ceilings, column and beam fireproofing using these components—also application, fastener spacing, etc.—see pertinent USG Systems Folders. For fire ratings, sound transmission loss data and comparative cost range, see USG Construction Selector.

X. installation of control joints

Where indicated on drawings, USG Control Joints (size) shall be attached with Bostitch 9/16″ "G" staples or equal spaced not over 6″ apart in each flange. (Control Joints Nos. 50, 75, 100—end joints shall be spliced together with 16 ga. tie wire inserted into openings in the key-lock sections.) (Control Joint No. 093—end joints shall be cut square, butted together and aligned for neat fit). Protective tape shall be removed when plastering is completed.

a. Interior Ceilings—spacings between control joints shall not exceed ( ) ft. in either direction and the area within separated sections shall not exceed ( ) sq. ft. (see pertinent USG Systems Folders). Lath shall be broken behind control joints; where channel framing is used, the channels shall also be broken. Control joints shall be positioned to intersect light fixtures, heating vents, air diffusers, etc.

b. Interior Walls and Partitions—control joints shall be spaced maximum of (20) (30) ft. apart, and may occur over door frames as indicated in drawings. When control joints are used in conjunction with PYROBAR Partition Tile, the tile shall be kerfed, directly under the control joint, to a depth of ¾″.

c. Exterior Soffits of Gypsum Plaster—spacings between control joints shall not exceed 10 ft. in either direction. Lath and channel shall be non-continuous behind control joints. All other specifications listed above are applicable.

d. Exterior Walls, Soffits and Canopies of Portland Cement Stucco—spacings between control joints shall not exceed 10 ft. in either direction. Where there is an intersection of vertical and horizontal joints, the vertical joint shall be continuous and the horizontal joint shall abut it. Splices and intersections exposed to the elements shall be caulked with a silicone rubber caulking cement. In soffits and canopies, lath and channel shall be non-continuous behind control joints.

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SHEETROCK* Gypsum Wallboard and Accessories

f

1877

A. I. A. File No. 23-L/23-J/20-B-2

description and utility

There is only one SHEETROCK—the interior wall and ceiling surface developed and improved by United States Gypsum. It is the product which has dominated the "drywall" revolution in construction—to the point where more than 75% of all new residential buildings are now finished with gypsum wallboard, and systems using SHEETROCK wallboard are fast gaining the same acceptance in commercial building.

SHEETROCK is a mill-fabricated gypsum wallboard composed of a fireproof gypsum core encased in a heavy manila-finished paper on the face side and a strong liner paper on the back side. The face paper is folded around the long edges to reinforce and protect the core, and the ends are square-cut and finished smooth.

SHEETROCK is manufactured in eight different forms for various applications. Complementing these is the industry's broadest line of metal accessories, fasteners and adhesives to provide complete partition and ceiling assemblies for dozens of specific applications. This catalog covers these products in three groups: (1) SHEETROCK Wallboard Products; (2) Metal Accessories for Wallboard; (3) Fasteners and Adhesives. A general specification appears on pages 9 to 12; performance and specification of assemblies using these components are covered in pertinent USG Systems Folders.

Interior walls and ceilings built with SHEETROCK gain a durable surface suitable for any type of decorative treatment and for repeated decoration during the life of the building. The joints between adjacent boards may be reinforced and concealed with the PERF-A-TAPE* Joint System, or may be featured by leaving exposed or covering with a decorative moulding.

Drywall Construction—mill-fabricated boards eliminate excessive moisture in construction.

Fire Protection—the gypsum core will not support combustion or transmit temperatures greatly in excess of 212° F. until completely calcined—a slow process. See USG Construction Selector for fire resistance ratings.

Crack Resistance—with joints reinforced by the PERF-A-TAPE Joint System, SHEETROCK Wallboard forms walls and ceilings exceptionally resistant to cracks caused by frame movement, vibration or minor settlement.

Speed—mill-fabricated boards are easily cut and quickly applied.

Quick Decoration—essentially a "dry" material, SHEETROCK Wallboard permits painting or other decoration, and the installation of metal or wood trim, almost immediately.

Non-Warping—expansion or contraction under normal atmospheric changes is negligible and does not cause harmful warping or buckling.

Availability—25 strategically located U.S.G. operating plants produce and/or stock the gypsum board materials described here. Five warehouse facilities, in addition to these plants, increase the total distribution and service efficiency to major markets and rural areas from coast to coast. All standard or specialty gypsum board products may be considered readily available and easily procured upon short notice.

*Reg. U.S. Pat. Off.

general limitations

1. Not recommended where exposure to moisture is extreme or continuous.

2. Must be adequately protected against wetting when used as a base for ceramic or other wall tile (see Insulating SHEETROCK limitation). SHEETROCK W/R Wallboard is the recommended product for this purpose.

3. Maximum spacing of framing members: ½″ and ⅝″ SHEETROCK Wallboard is designed for use on framing centers from 16″ to 24″; ⅜″ and ¼″ SHEETROCK, on centers up to 16″. In both walls and ceilings, when ½″ or ⅝″ SHEETROCK Wallboard is applied across framing on 24″ centers and joints reinforced, headers are not required.

4. Application of SHEETROCK over ¾″ wood furring applied across framing is not recommended since the relative flexibility of the furring under impact of the hammer tends to loosen nails already driven. Furring should be 2″ x 2″ minimum.

5. The application of SHEETROCK over an insulating blanket, that has first been installed continuously across the face of the framing members, is not recommended. Blankets should be recessed and the blanket flanges attached to sides of studs or joists.

SHEETROCK Wallboard complies with Federal Specification SS-L-30b; ASTM C36.

A. I. A. File No. 23-L/23-J/20-B-2

types and functions

1. SHEETROCK* Wallboard Products

Tapered Edge SHEETROCK has long edges tapered on the face side in order to form a shallow channel for the joint reinforcement which provides smooth, continuous wall and ceiling surfaces. Made in four thicknesses:

5/8", recommended for the finest single layer drywall construction. The greater thickness provides increased resistance to fire exposure and transmission of sound.

1/2", for single layer application in new residential construction.

3/8", lightweight, applied principally in the double wall system and in repair and remodel work.

1/4", a lightweight, low cost, utility gypsum wallboard, for use over old wall and ceiling surfaces.

Width: 4'; length: 8', 9', 10', 12' or 14' (except 1/4", available in 8' and 10' lengths only); edges: tapered; finish: ivory manila paper, suitable for paint, wallpaper or other decoration.

SHEETROCK FIRECODE* Wallboard, made in 5/8" and 1/2" thicknesses, combines all the advantages of Regular SHEETROCK with additional resistance to fire exposure—the result of a specially formulated core containing special mineral materials.

Facings of SHEETROCK FIRECODE have qualified for fire ratings of up to 2 hours in walls, 3 hours in ceilings, 3 hours for column protection. See USG Construction Selector for description of tested assemblies.

Limitations (also refer to General Limitations, page 1): (1) In order to attain fire resistance ratings, the construction of the partition and/or floor and ceiling assemblies must conform to the panel designs as tested at the indicated fire testing facilities. See USG Systems Folders for description of panel constructions. (2) Maximum spacing of frame members: 24" c. to c.

Width: 4'; length: 8', 9', 10', 12' or 14'; edges: tapered; finish: ivory manila paper, suitable for paint, wallpaper or other decoration.

Where to use SHEETROCK Wallboards

construction (type)→	Regular			FIRECODE		Insulating (foil back)			ULTRA-WALL	Vinyl Wallbd.	W/R Wallbd.	BAXBORD Backing Board		
(thickness)→	1/4"	3/8"	1/2" & 5/8"	1/2"	5/8"	3/8"	1/2"	5/8"	3/8" only	3/8", 1/2" or 5/8"	1/2" & 5/8"	3/8"	1/2"	5/8"
WALLS														
Exterior Walls														
Single Layer														
masonry (furred)			X	X	X	X	X	X						
wood framing			X	X	X	X	X	X						
Double Layer Masonry (furred)														
base						X	X	X				X	X	X
finish	X	X	X	X	X				X	X				
Ceramic or Other Tile Base														
masonry (furred)		X	X	X	X	X	X	X			X	X	X	X
wood framing		X	X	X	X	X	X	X			X	X	X	X
Interior Walls														
Single Layer														
over existing walls	X	X							X	X				
masonry (furred)			X	X	X									
wood framing			X	X	X									
metal framing			X	X	X									
Double Layer														
masonry (furred)														
base		X	X	X	X							X	X	X
finish		X	X	X	X				X	X				
wood framing														
base		X	X	X	X							X	X	X
finish		X	X	X	X				X	X				
metal framing														
base		X	X	X	X							X	X	X
finish		X	X	X	X				X	X				
Ceramic or Other Tile Base														
masonry (furred)		X	X	X	X						X		X	X
wood framing		X	X	X	X						X		X	X
metal framing		X	X	X	X						X		X	X
CEILINGS														
Single Layer														
over existing ceiling	X	X							X	X				
wood framing		X	X	X	X	X	X	X	X	X				
metal framing			X	X	X	X	X	X						
Double Layer														
wood framing														
base		X	X	X	X	X	X	X				X	X	X
finish		X	X	X	X				X	X				
metal framing														
base		X	X	X	X	X	X	X				X	X	X
finish		X	X	X	X				X	X				
Acoustical Base														
over suspended metal grillage													X	X
over channel or nailable steel studs		X	X	X	X								X	X

*Reg. U.S. Pat. Off.

Insulating SHEETROCK is made by laminating special kraft-backed aluminum foil to the back surface of regular SHEETROCK wallboard. It is effective as a vapor barrier for exterior walls and ceilings when applied (1) with foil surface next to the studs in single layer application, or (2) as the base layer (with foil surface next to the studs) in the double layer system. A significant thermal insulating value is achieved when SHEETROCK is installed with the aluminum foil facing an air space of ¾″ minimum (for construction details, see USG Folder e-1777). The scuff-resistant metal foil reduces outward heat flow in winter, and inward heat flow in summer.

With Insulating SHEETROCK, the possibility of condensation within an exterior wall, and resulting exterior paint failures, is minimized. Meets ASTM requirements for a vapor permeability not exceeding 0.30 perm. **Limitation:** do not use as a base for ceramic or other tile. Thickness: ⅜″, ½″ and ⅝″. Sizes, edges and finish are same as for regular Tapered Edge SHEETROCK.

SHEETROCK Vinyl Panel Wallboard is a new pre-decorated product with an unequalled range of pattern and color, durable and virtually maintenance-free. A rugged vinyl film is factory-laminated to beveled edge SHEETROCK providing long-lasting resistance to stains and scuffs, plus ready washability. The standard gypsum core protects against fire. Adaptable to any USG partition system, also ideal for resurfacing; beveled edges form pleasing "V" groove at joint when boards are erected; no further treatment needed. Total of more than 730 different colors and patterns available in the three series of vinyl-faced wallboards offered by U.S.G.:

SHEETROCK VICRTEX, VICRWALL and VICRTEX-T Vinyl Panel Wallboard provide a cloth-backed vinyl facing of 18 to 30 mils thickness. Available in 48″ widths, 6′ to 16′ lengths, in either plain core ⅜″, ½″ or ⅝″ SHEETROCK, ½″ FIRECODE "C" Wallboard, or ⅝″ SHEETROCK FIRECODE Wallboard. VICRTEX comes in 414 colors and 22 patterns including straw-cloth, burlaps, linens, heavy stipples, woodgrains; VICRWALL in 5 lower-priced patterns and 94 colors; VICRTEX-T in 95 colors and 5 patterns treated with DuPont Tedlar film for added durability and easier cleaning.

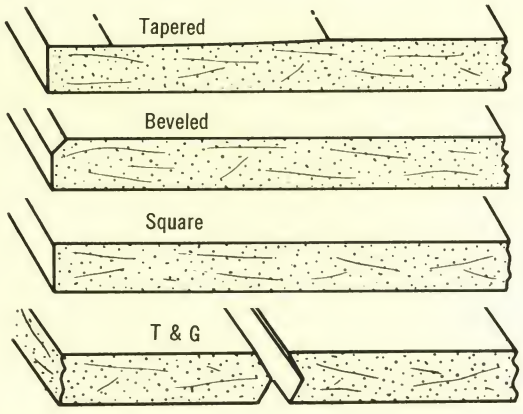
SHEETROCK Standard Vinyl Panel Wallboard has an 8 mil unbacked vinyl facing, available in 8 colors embossed with slight texture pattern, plus Cherry, Teak and Walnut wood-grained finishes. Standard thickness: ½″; width: 48″; length: 8′, 9′ or 10′. Matching colored nails and moldings available.

SHEETROCK Custom Vinyl Panel Wallboard, also faced with 8 mil unbacked vinyl film, is offered in choice of 119 designer-selected colors and six different patterns. Thickness: ⅜″, ½″ or ⅝″; width: 48″; length: 8′, 9′ or 10′.

Limitation: do not use DWA-14, DWA-10 or other solvent-based adhesive for application of SHEETROCK Standard Vinyl Panel Wallboard over metal studs or treated wood framing. These adhesives may be used with SHEETROCK Custom Vinyl Panel Wallboard and SHEETROCK VICRTEX A, B, C and T and VICRWALL Vinyl Panel Wallboard. Because of the potential incompatibility between vinyl-surfaced wallboard and solvent-based adhesives, United States Gypsum cannot be responsible for problems arising from the use of either its adhesives with vinyl-surfaced wallboard manufactured by others, or its vinyl-surfaced wallboard applied with adhesive made by others.

ULTRAWALL* Panels are also pre-decorated, in V-groove, random plank patterns to simulate fine wood paneling. The finish may be treated with clear or opaque coatings when additional protection is desired (see specifications, USG Folder f-1917). Matching colored nails are used for inconspicuous

SHEETROCK Wallboard Products—Types of Edges



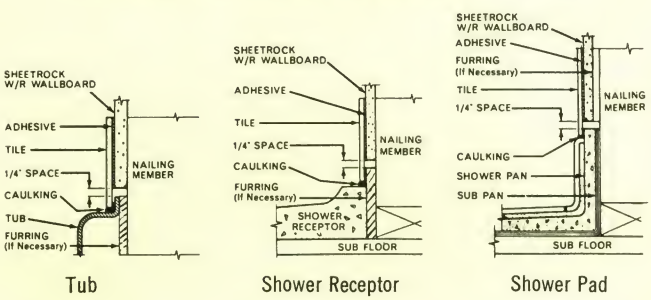
nailing; molding available in matching patterns (see page 5). Thickness: ⅜″; width: 4′; length: 7′, 8′, 9′ or 10′; edges: square; finishes: Club Walnut, Orchard Cherry, Java Teak, Ranch Pine and Scandia.

SHEETROCK W/R Gypsum Wallboard is a new water-resistant gypsum wallboard that provides an excellent base for the adhesive application of ceramic, metal, and plastic tile. It is water resistant all the way through: (1) multi-layered face and back paper are chemically treated to combat penetration of moisture; (2) the gypsum core is made water-resistant with a special asphalt composition. It was developed for application in bathrooms, powder rooms, kitchens, utility rooms, etc. SHEETROCK W/R Gypsum Wallboard is easily recognized because of its distinctive green face.

In addition to its use as a superior tile base in new construction, SHEETROCK W/R Wallboard is a cost-saver in modernization work. It permits new tilework to be installed over existing surfaces without tearing out old walls. **Limitations:** adherence to recommendations concerning sealing exposed edges, painting, tile adhesives, framing and installation is necessary for satisfactory performance (see Specifications).

Available in plain core, ½″ and ⅝″ thickness; also in ⅝″ SHEETROCK W/R FIRECODE "C" Wallboard for applications where a 1-hour fire rating is desired—listed under UL Label Service R-1319-84 with following design numbers applicable: 5-1 hr., 16-1 hr., 17-1 hr., 4-2 hrs., 11-2 hrs. and 17-2 hrs. Width: 4′; length: 8′, 10′ or 12′; edges: tapered; finish: green treated manila paper, suitable for receiving tile, paint or wallpaper.

SHEETROCK W/R Wallboard installation details for tub and shower areas



*Reg. U.S. Pat. Off.

1″ USG® Coreboard is a solid gypsum board product fabricated for use with the USG Solid and Double Solid Partitions (see USG Folders a-1047, a-1077). Additional layers of gypsum board are generally laminated to the coreboard to provide the completed wall assembly. When used in conjunction with the 2″ Solid and Double Solid Partitions, coreboard is manufactured with an integrally formed "V" T & G edge. USG Coreboard, as used with semi-solid partitions is available in 1″ x 24″ panels prescored either 6″ or 8″ o.c. Coreboard strips are then easily snapped and separated from this master unit. Thickness: 1″; width: 24″; edges: "V" T & G or square; length: 8′, 9′, 10′ and 12′ (prescored—7′-8″ lengths only); finish: gray paper, not suitable as an exposed surface.

USG Gypsum Studs and Ribs are made in two thicknesses and stock lengths to serve as non-bearing internal members of four USG Studwall and Ribwall partition systems. The 1⅝″ x 6″ Gypsum Stud is factory-laminated from one layer ⅝″ SHEETROCK* Gypsum Wallboard sandwiched between one layer each side of ½″ SHEETROCK, and is used in the USG Studwall #258 and #278 partitions (see USG Folder a-1057) as well as in the USG Ribwall #368 partition (see USG Folder a-1067). The 1″ x 6″ Gypsum Rib is snapped and separated on the job from stock lengths of 1″ x 24″ USG Coreboard prescored 6″ o.c., and is used in the USG Ribwall #418 drywall partition (see USG Folder a-1067). USG Laminating Adhesive or PERF-A-TAPE* Joint Compound (embedding type) is used in laminating studs and ribs to base layer or face panels.

BAXBORD* Gypsum Backing Board is a low cost, easy-to-handle gypsum board encased on both sides with strong gray paper, made in three thicknesses:

⅜″ **BAXBORD,** for use as a base for the job-laminated Double Wall SHEETROCK Wallboard system, and the USG Metal Stud partition system. It may also be used as a base for acoustical tile when applied perpendicular to wood joists spaced not over 16″ o.c.

½″ **BAXBORD,** the recommended base for adhesively or mechanically applied acoustical tile. It may be screw applied to the USG Drywall Furring Channel; nailed to metal furring members or nailable steel joists; or nailed to wood framing.

⅝″ **BAXBORD FIRECODE,** for use as a base for adhesive or mechanical application of acoustical tile when a one-hour fire-rating is required. "V" tongue and groove edges minimize air and dirt infiltration.

Limitations: (1) In order to attain fire resistance ratings with ⅝″ BAXBORD FIRECODE backing board, the construction must be in accordance with the floor or roof and ceiling design listed by Underwriters' Laboratories, Inc. (see USG Construction Selector). (2) Where ½″ or ⅝″ BAXBORD is to be used as acoustical tile base, store acoustical tile and base in a dry area protected from the elements. Provide flat, solid support during storage. Take necessary precautions to prevent condensation in the storage area and within the structure in which the acoustical base is applied.

Width: 2′ and 4′; length: 8′; edges: ⅜″ BAXBORD, square edge; ½″ and ⅝″ BAXBORD, "V" T & G or square edge; finish: gray paper, not suitable as an exposed surface.

Insulating BAXBORD Gypsum Backing Board is made in the same three thicknesses as standard BAXBORD, but with aluminum foil laminated to the back surface. It functions as a vapor barrier and as thermal insulation in the same manner as Insulating SHEETROCK Wallboard. Dimensions, edges and face side finish are identical with standard BAXBORD (above).

Application and Frame Spacing—SHEETROCK Wallboard

thickness (tapered edge)	approx. weight psf.	location	application method	max. frame spacing c. to c.
⅜″	1.5	ceilings	horizontal	16″
⅜″	1.5	sidewalls	horizontal or vertical	16″
½″	2.0	ceilings	vertical horizontal	16″ 24″
½″	2.0	sidewalls	horizontal or vertical	24″
⅝″	2.6	ceilings	vertical horizontal	16″ 24″
⅝″	2.6	sidewalls	horizontal or vertical	24″

Bending of SHEETROCK Wallboard

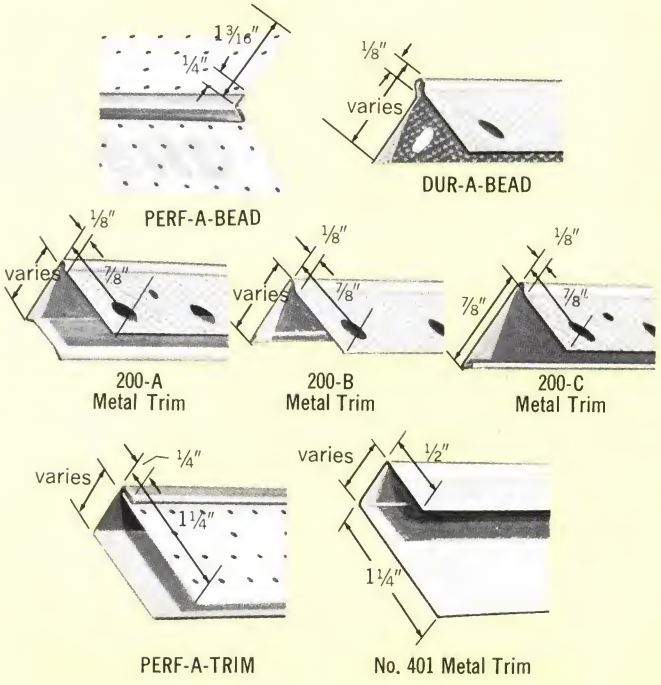
SHEETROCK thickness	bending radii with dry SHEETROCK	
	lengthwise	width
½″	20′ (1)	—
⅜″	7½′	25′
¼″	5′	15′

(1) Bending two ¼″ pieces successively permits radii shown for ¼″ SHEETROCK.
NOTE: By moistening the face and back paper thoroughly prior to application, and replacing in the stack for at least one hour, the board may be bent to still shorter radii. When the board dries thoroughly, it will regain its original hardness.

2. USG Metal Accessories for Wallboard

No. 100 PERF-A-BEAD* is a metal corner reinforcement formed of galvanized steel with PERF-A-TAPE wings 1¼″ wide. Easily applied with PERF-A-TAPE Joint Compound; provides lasting protection for external corners.

DUR-A-BEAD* is an all-metal heavy gauge hot dipped galvanized steel reinforcement for protecting external corners. It is nailed to framing through gypsum wallboard and concealed with PERF-A-TAPE Joint Compound as a smooth, finished corner. Available in three flange widths: **No. 101** 1″x1″;



*Reg. U.S. Pat. Off.

No. 102 1″x1¼″; **No. 103** 1¼″x1¼″. Also available in lighter gauge ECONO* models: **Standard** 15/16″x15/16″; **No. 102** 1″x1¼″; **No. 103** 1¼″x1¼″; **No. 104** 1⅛″x1⅛″.

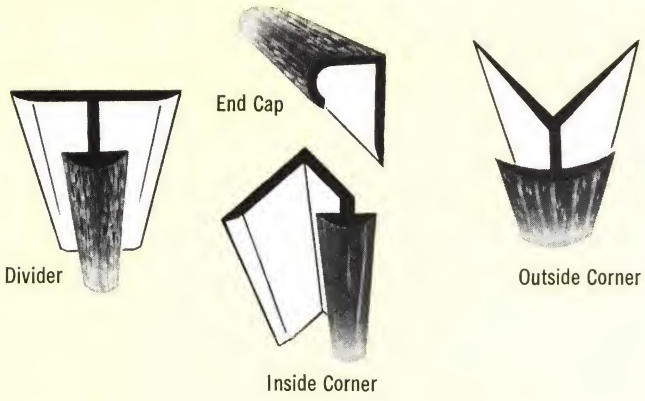
USG Metal Trims provide maximum protection and neat finished edges to gypsum wallboard at window and door jambs, at ceiling angles and at intersections where wallboard abuts other materials. Easily installed by nailing through the channel and wallboard into the framing or jamb. Eliminate precision cutting and mitering; joints are simply butted together. Finished with PERF-A-TAPE* Joint Compound (except #400 series). Made in three types, ten sizes:

#200 series—steel casing, includes **No. 200-A** U-shaped channel in ½″ and ⅝″ sizes; **No. 200-B** L-shaped angle edge trim without back flange to simplify application, in ½″ and ⅝″ sizes; **No. 200-C** L-shaped trim, requires slotted jamb for installation in most cases, open "V" edge of flange inserts into ⅛″ kerf to make trim adjustable for use with ⅜″, ½″ and ⅝″ gypsum wallboard.

PERF-A-TRIM* #300 series—galvanized channel with a PERF-A-TAPE flange attached, suitable for single or double layer wallboard construction, includes **No. 300** in ⅜″ size and **No. 301** in ½″ size.

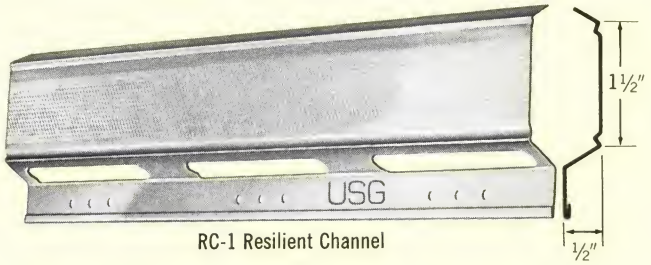
#400 series—reveal type all-metal trim, requires no finishing compound, includes **No. 400** in ⅜″ size, **No. 401** in ½″ size, **No. 402** in ⅝″ size.

SHEETROCK Moldings



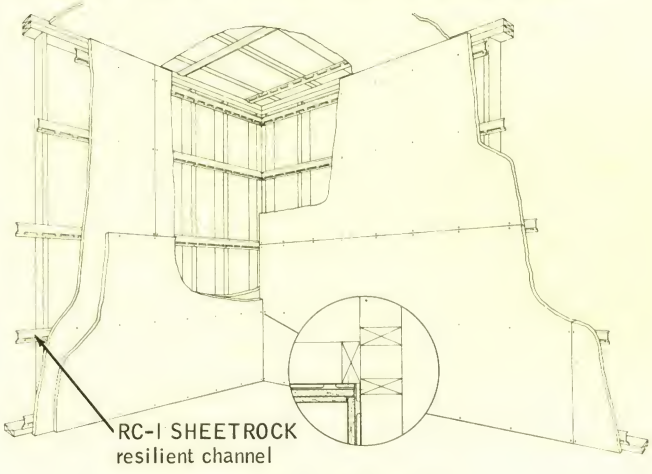
SHEETROCK* Moldings are available in permanently bonded matching finishes to enhance the beauty and durability of ULTRAWALL* and SHEETROCK Vinyl Panel Wallboard installations. Made of precision extruded aluminum, they cover joints and protect corners. Four shapes—Divider, Inside Corner, Outside Corner and End Cap—match the five woodgrained finishes of ⅜″ ULTRAWALL and the 11 finishes of ½″ SHEETROCK Standard Vinyl Panel Wallboard. The 8′ lengths are easily cut and mitered.

RC-1 SHEETROCK Resilient Channel is a 25-ga. electrogalvanized steel channel which provides for resilient attachment of gypsum wallboard to wood framing or through a wallboard base layer to USG Metal Studs (both systems illustrated at right). Widely used to improve sound transmission loss in partitions and ceilings of garden-type apartments, motels and other structures (see USG Construction Selector). Pre-punched holes in the flange facilitate screw fastening to framing members; SHEETROCK is attached to channel by 1″ or 1⅝″ USG Drywall Screws Type S. Width:

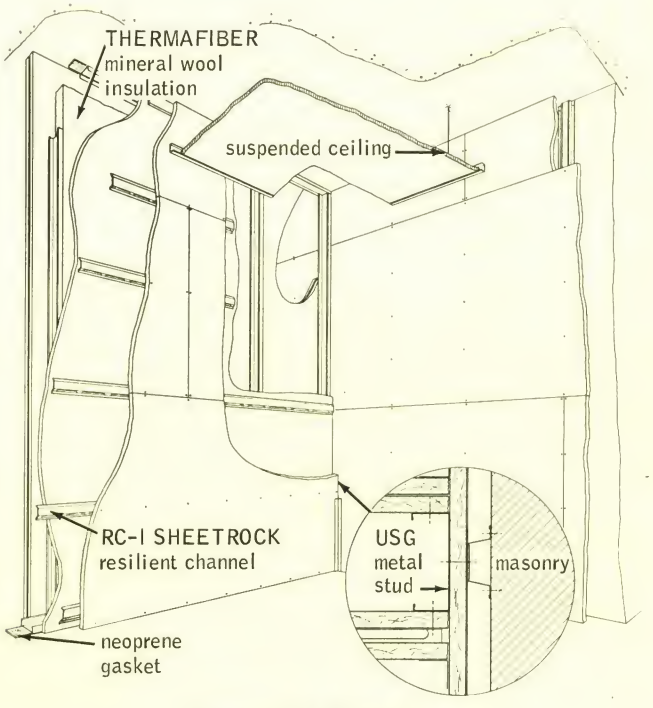


RC-1 Resilient Channel

2¾″; depth, ½″; length, 12′. **Limitation:** not for use beneath highly flexible floor joists; should be attached for ceiling use only with 1¼″ USG Drywall Screws Type W; see Wood Framing Requirements in "Fasteners and Adhesives" section.



Attachment to Wood Framing



Attachment to USG Metal Studs

*Reg. U.S. Pat. Off.

USG® Metal Studs are non-load bearing channel type studs roll formed from 25-ga. electro-galvanized steel (or hot-dipped galvanized steel, made with keyhole slots, available in selected markets). They are designed for screw attachment of ⅜″, ½″ and ⅝″ SHEETROCK* Wallboard in USG metal stud partitions and column fireproofing (see USG Folders a-1207, d-1737). One end of each stud is notched, and knockouts are located at 24″ intervals to facilitate pipe and conduit installation. Available in four sizes, 8′ to 16′ lengths, with structural properties as follows:

USG stud designation	width	stud spacing	max. height(1) (2)	max. height(1) (3)	max. height(1) (4)	structural properties I in.⁴ x-x	structural properties S in.³ x-x	structural properties R in. x-x
No. 158	1⅝″	12″ 16″ 24″	10′9″ 10′3″ 9′0″	11′6″ 10′0″ 8′0″	8′0″ 7′0″ 5′9″	.046	.0489	.673
No. 212	2½″	12″ 16″ 24″	14′9″ 14′0″ 12′0″	15′3″ 13′3″ 10′9″	10′9″ 9′3″ 7′6″	.122	.0862	1.010
No. 358	3⅝″	12″ 16″ 24″	20′0″ 19′0″ 16′0″	19′6″ 17′0″ 13′9″	13′9″ 12′0″ 9′9″	.284	.142	1.411
No. 400	4″	12″ 16″ 24″	21′6″ 20′3″ 17′3″	20′3″ 17′9″ 14′6″	14′3″ 12′6″ 10′3″	.334	.156	1.528

(1) Height is not limited by length of unsupported run or size and location of openings.
(2) Max. height allowable where no superimposed load is applied perpendicular to partition.
(3) Max. height allowable where a 5 psf uniform load is applied perpendicular to partition.
(4) Max. height allowable where a 10 psf uniform load is applied perpendicular to partition.

USG Metal Runners are 25-ga. steel channel-type sections designed to secure various types of USG partitions to floor and ceiling. Electro- or hot-dipped galvanized; available in five sizes—Nos. 158, 1⅝″ wide; 212, 2½″ wide; 358, 3⅝″ wide, and 400, 4″ wide—all used with the USG metal stud partition; L-shaped runner, ⅞″ x 1⅜″, used with solid and double solid gypsum partitions. The four metal stud runners are unhemmed, available with either a 1″ or 1¼″ leg—the latter for use where metal snap-on base is attached to runner track with clips. Length: 10′ and 12′.

USG Metal Furring Channels are ceiling and wall channels made of 25-ga. electro-galvanized steel designed for attachment of ⅜″, ½″ and ⅝″ SHEETROCK with 1″ USG Drywall Screws Type S. Face width: 1⅜″; depth: ⅞″; length: 12′.

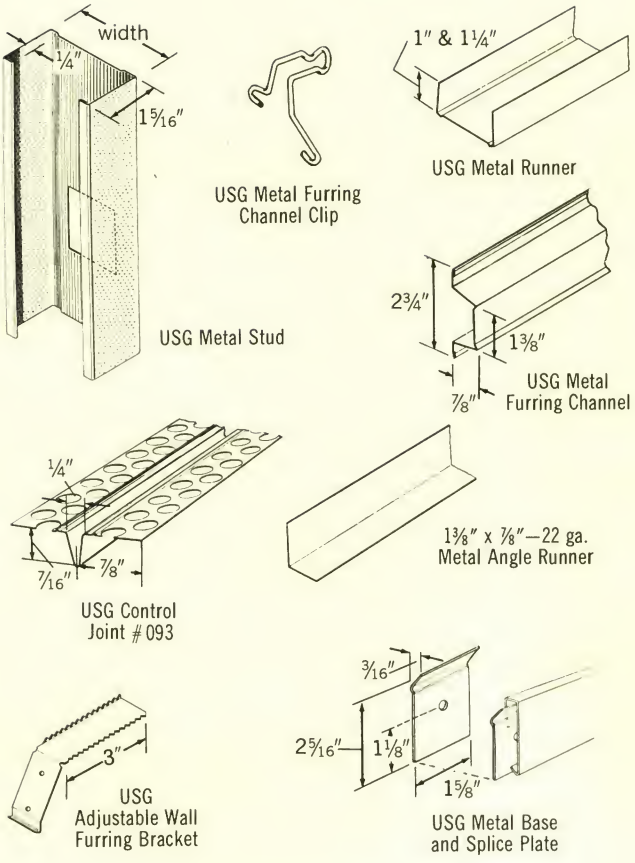
USG Furring Channel Clips are made of galvanized wire and used in attaching Metal Furring Channels to 1½″ cold-rolled runner channels. They are installed on alternate sides of the carrying channels; where clips cannot be alternated, wire tying is recommended.

USG Adjustable Wall Furring Brackets are used for attaching ¾″ furring channels to exterior masonry walls. Made of 20-ga. galvanized steel with serrated edges, they are wire-tied to horizontal stiffeners, 24″ o.c., in braced furring systems: fur out board ¼″ to 2¼″ plus channel depth.

USG Cold-Rolled Channels, made of 16-ga. steel, are used for furring, and in suspended ceilings and partition construction. Available either galvanized or black asphaltum painted. Sizes: ¾″, with ½″ flange; 1½″, with 19/32″ flange; 2″, with 19/32″ flange. Lengths: 16′ and 20′.

USG Control Joint No. 093 is used to relieve stresses of expansion and contraction in large ceiling and wall areas. Used from floor to ceiling in long partition runs, and from door header to ceiling. Made from roll-formed zinc with a tape-protected ¼″ opening 7/16″ deep. Lengths: 8′ and 10′. **Limitation:** where sound and/or fire ratings are prime considerations, adequate protection must be provided behind the control joint.

USG Metal Base provides a 2½″ wide 18-ga. metal face plate as a flush-type or reveal-type wall base. **USG Splice Plates** are furnished to connect face plates at joints. Supplied in 10′ lengths.



Attachment Schedule—Furring Channels and Metal Studs

	for attachment to: 1½″ channel	bar joists	concrete joists	wood joists	wood beams	concrete slab	masonry
USG Metal Furring Channels	X	X	X	X	X	X	X
USG Metal Studs all sizes	X	X					

Drywall Ceiling Systems—Component Spacing

		furring member c. to c. spacing for Wallboard thickness of: ⅜″	½″	⅝″	main support member c. to c. spacing for Wallboard thickness of: ⅜″	½″	⅝″	hangers c. to c.
USG Metal Furring Channel		16″	24″	24″	5′-0″	4′-0″	4′-0″	4′-0″
USG Metal Stud	1⅝″ erected with both flanges up and against main support member	16″	24″	24″	7′-0″	6′-0″	6′-0″	4′-0″
	2½″	16″	24″	24″		6′-0″		
	3⅝″	16″	24″	24″		8′-0″		

*Reg. U.S. Pat. Off.

3. USG Fasteners and Adhesives for Wallboard

USG® Drywall Screws are aimed at producing the best possible attachment of SHEETROCK* Gypsum Wallboard. The development of a complete line of special self-drilling, self-tapping screws not only has improved installation methods but has made possible today's broad selection of drywall systems applied over metal framing. Screws must be used with such systems, with the exception of ⅝″ wallboard applied to steel nailing channels, where annular ring nails may be used. The superior holding power of drywall screws has virtually

Selector Guide For USG Drywall Screws

function and description	fastening applications	screw spacing c. to c.	approx. no. screws req. per MSF
SHEETROCK Wallboard to Metal Framing 1″ USG Drywall Screw—Type S—Bugle Head	Single Layer SHEETROCK Wallboard to 25-ga. steel studs; SHEETROCK Wallboard to RC-1 Resilient Channel; SHEETROCK Wallboard to metal furring; Batten strips in movable partitions	12″ (face layer) (8″ at abutting edges and ends for fire-rated assemblies over metal studs, vertical appl.)	990 (vert. bd. appl.) 1190 (partial 8″ spacing) 810 (horiz. bd. appl.)
1″ USG Drywall Screw—Type S-12—Bugle Head Also in 1¼″ & 1⅞″ lengths	SHEETROCK Wallboard to 12-ga. (max.) steel studs	16″ (base layer without adhesive) 12″ (base layer with adhesive)	
1¼″ USG Drywall Screw—Type S—Bugle Head	1″ core units to L runner in 2″ Solid, Semi-Solid, Double-Solid and Triple-Solid Partitions; USG Metal Base and splice plates	24″	125
1⅝″ USG Drywall Screw—Type S—Bugle Head Also in 1 5/16″ length	Double-layer ½″ SHEETROCK Wallboard to 25-ga. steel studs; Double-layer ½″ wallboard to metal furring	16″ (face layer)	700
1⅞″ USG Drywall Screw—Type S—Bugle Head	½″ SHEETROCK Wallboard face layers to L runners in 2″ Solid, Semi-Solid, Double-Solid and Triple-Solid Partitions	As necessary	—
2¼″ USG Drywall Screw—Type S—Bugle Head	⅝″ SHEETROCK Wallboard face layers to L runners in 2″ Solid, Semi-Solid, Double-Solid and Triple-Solid Partitions; Face-layer SHEETROCK Wallboard—at floor line—in Metal Stud and RC-1 Resilient Channel systems	As necessary	—
Wood Trim to Metal Framing 1⅝″ USG Drywall Screw—Type S—Trim Head	Wood trim over single-layer SHEETROCK Wallboard on 25-ga. steel studs	As necessary	—
2¼″ USG Drywall Screw—Type S—Trim Head	Wood trim over double-layer SHEETROCK Wallboard on 25-ga. steel studs	As necessary	—
Metal Studs to Door Frames, Runners (a) ⅜″ USG Drywall Screw—Type S-12—Pan Head (b) Also in ⅜″ Type S—Pan Head (c) Also in ½″ size for E-Z WALL application	(a) Metal door frame to 12-ga. (max.) steel studs; (b) Metal studs to metal runners	As necessary	—
Metal Trim & Door Hinges to Metal Framing ⅞″ USG Drywall Finishing Screw—Type S—Oval Head, cadmium plated	Door hinges to door frame and aluminum components to metal; screw matches hardware and trim	As necessary	—
1¼″ USG Drywall Finishing Screw—Type S—Bugle Head, cadmium plated Also in 1⅛″ length	Aluminum trim to metal studs in USG Demountable partition; screw matches hardware and trim	As necessary	—
SHEETROCK Wallboard to Wood Framing 1¼″ USG Drywall Screw—Type W—Bugle Head	Single-layer SHEETROCK Wallboard to wood framing	Ceilings 12″, walls 16″ with studs 16″ o.c.—both 12″ with studs 24″ o.c.	1100
Gypsum to Gypsum 1½″ USG Drywall Screw—Type G—Bugle Head	Multi-layer gypsum to gypsum (not recommended for double layer ⅜″ SHEETROCK Wallboard laminated partitions)	As necessary	—

NOTES: For steel applications not shown, select a screw length which is at least ⅜″ longer than total thickness of materials to be fastened. USG Drywall Screws are manufactured under U.S. Patents Nos. 2,871,752—3,056,234—3,125,923—3,207,023—3,221,588.

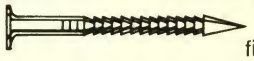
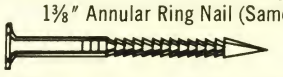
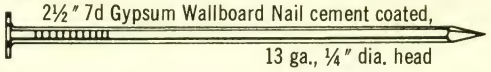
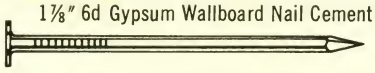
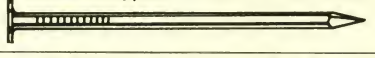
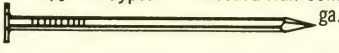
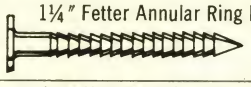
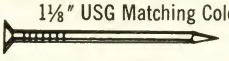
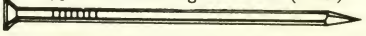
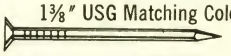
*Reg. U.S. Pat. Off.

eliminated loose board attachment and consequent problems of "nail pops" in wood frame construction. Fewer screws than nails are generally required, and speed of installation compares favorably with nailing when electric screw guns (illustrated) are used. Fracturing of the gypsum core and damage to face paper are minimized. Tests have shown USG Drywall Screws to have 100% greater withdrawal resistance than GWB-54 nails.

Wallboard Nails have been vastly improved since discovery of the fact that minimum penetration of the wood frame, and consequent minimum exposure of the nail shank to subsequent wood shrinkage, is desirable. Nails have been developed to concentrate maximum holding power over the shortest possible length—notably the annular ring type nail which has about 20% greater holding power than a cement-coated cooler type nail of the same length and other characteristics.

As in the case of screws, specification of the proper nail for each application is extremely important. Nail selection is recommended as below to comply with performance standards adopted by the Gypsum Association. For application specifications, see pertinent USG Systems Folders.

Selector Guide For Wallboard Nails

fastening applications	fastener description	nail spacing c. to c. (1)	approx. lbs. nails req. per MSF SHEETROCK
½″, ⅜″ and ¼″ SHEETROCK* Wallboard; ½″ and ⅜″ BAXBORD* Gypsum Backing Board to wood frame (2) (3)	1¼″ GWB-54 Annular Ring Nail 12½ ga.; ¼″ dia. head with a slight taper to a small filet at shank; bright finish; medium diamond point 	7″ ceiling 8″ walls	5¼
⅝″ SHEETROCK Wallboard to wood frame (3)	1⅜″ Annular Ring Nail (Same as GWB-54 except for length) 	7″ ceiling 8″ walls	5¼
⅝″ SHEETROCK FIRECODE Wallboard face layers to staggered wood studs over ½″ USG Wood Fiber Sound Deadening Board	2½″ 7d Gypsum Wallboard Nail cement coated, 13 ga., ¼″ dia. head 	7″ walls (face layer)	9
⅜″ and ¼″ SHEETROCK Wallboard over existing surface, wood frame	1⅞″ 6d Gypsum Wallboard Nail Cement Coated, 13 ga., ¼″ dia. head 	7″ ceiling 8″ walls	6¼
⅝″ SHEETROCK FIRECODE* Wallboard to wood frame	1⅞″ 6d Gypsum Wallboard Nail Cement Coated, 13 ga., ¼″ dia. head 	6″ ceiling 7″ walls	6¾
½″ SHEETROCK FIRECODE Wallboard to wood frame	1⅝″ 5d Gypsum Wallboard Nail Cement Coated, 13½ ga., 15/64″ dia. head 	6″ ceiling 7″ walls	5¼
⅝″ SHEETROCK FIRECODE Wallboard; ⅝″ BAXBORD FIRECODE Gypsum Backing Board to steel nailing channel	1¼″ Fetter Annular Ring Nail 11 ga., 5/16″ dia. head 	6″ ceiling	6
ULTRAWALL* Panels—to wood frame (3)	1⅛″ USG Matching Color Nail (Steel) 	8″ walls	1½
—over existing surface, wood frame (3)	1⅞″ USG Matching Color Nail (Steel) 	8″ walls	4½
SHEETROCK Vinyl Panel Wallboard (11 finishes) to wood frame (3)	1⅜″ USG Matching Color Nail (Brass) 	8″ walls	1¾

NOTES: (1) Spacings shown are for single layer application without adhesive. (2) See Wood Framing Requirements and Heating Recommendations at end of this section. (3) Nails shown for this application are also the proper size for use with adhesive.

Selector Guide For Drywall Adhesives

attachment applications	adhesive description	features
SHEETROCK Wallboard to BAXBORD Gypsum Backing Board or SHEETROCK base layer	PERF-A-TAPE Joint Compound (embedding type)—mixed with water, applied with spreading tool	Tight bond; permits adjustment of boards after contact; temporary nailing required; qualifies for fire-rated construction
	USG Laminating Adhesive—mixed with water, applied with spreading tool	Excellent bond; levels minor misalignments; temporary fastening required
SHEETROCK Wallboard to USG Sound Deadening Board	PERF-A-TAPE Joint Compound (embedding type) or USG Laminating Adhesive—mixed with water, applied with spreading tool	Excellent bond; supplemental fastening required
SHEETROCK Wallboard to wood framing	DWA-14 Adhesive—applied in continuous bead to face of framing members with cartridge gun (2)	50% to 100% greater bond strength than with conventional fastening; eliminates all field nails on walls, most nails on ceilings; bridges minor framing irregularities; not to be used with Insulating SHEETROCK (1)
	DWA-10 Mastic—applied in continuous bead to face of framing members with cartridge gun	Reduces face nailing needed by 50%; reduces impact sound; requires supplemental fasteners at 12″ to 16″ intervals into all 16″ framing; can be used with Insulating SHEETROCK Wallboard (1)

NOTES: (1) Not to be used in fire-rated construction. (2) Meets ASTM #C-557-65T.

*Reg. U.S. Pat. Off.

Spreader application of adhesive

USG® Drywall Adhesives represent the latest advancement in wallboard attachment where the finest room interiors are desired. Their use greatly reduces the nail or screw fastening otherwise required, thus saves labor on spotting and sanding —also minimizes nail pops and joint ridging.

Two USG adhesives are recommended for laminating gypsum wallboard to gypsum backing board in multi-layer partitions and ceilings: **PERF-A-TAPE* Joint Compound** (embedding type) and **USG Laminating Adhesive,** both dry powder products, applied by spreader, require mixing and temporary fastening in application; qualify for fire-rated construction.

Two SHEETROCK Brand adhesives, **DWA-14** and **DWA-10,** are designed to adhere wallboard directly to wood framing with a minimum of supplemental fasteners required. A water-based contact bond drywall adhesive, commercially available, is used to laminate SHEETROCK Gypsum Wallboard to USG Metal Studs in the USG Demountable Partition System (see USG Folder a-1287).

Also available is **SHEETROCK Brand W/R Sealant,** applied to all raw cut edges and nail heads of special SHEETROCK Water-Resistant Gypsum Wallboard used in high-moisture room areas—thus protecting the gypsum core from moisture penetration.

For application specifications, see pertinent USG Systems Folders. Other drywall joint treatment products are covered in USG Folder f-1887.

Fastener Spacing—DWA-14 Adhesive Nail-on Application to Wood Framing

board application	ceilings
1. across joists	At each framing intersection and 16″ o.c. at each board end; one temp. fastener per framing member at mid-width of board
2. parallel to joists	At each framing intersection on ends and 16″ o.c. along board edges; 24″ o.c. on intermediate supports
	walls
3. horizontal appl.	Same as No. 1 above, except no field fasteners required
4. vertical appl.	Same as No. 2 above, except no fasteners required on intermediate supports (1)

NOTES: (1) Where fasteners at the vertical joints of the panel are objectionable, the gypsum wallboard may be prebowed and fasteners applied 16″ o.c. only at the top and bottom of the panel. Prebowing not recommended for pre-decorated panels.

Fastener Spacing—DWA-10 Mastic Nail-on Application to Wood Framing

frame spacing c. to c.	ceilings		partitions load bearing		partitions non-load bearing	
	nail	USG Screw Type W	nail	USG Screw Type W	nail	USG Screw Type W
16″	16″	16″	16″	24″	24″	24″
24″	12″	16″	12″	16″	16″	24″

NOTE: Mastic is not required at inside corners, top or bottom plates, bracing or fire stops, and is not ordinarily used in closets.

Wood Framing Requirements: wood framing meeting the following minimum requirements is necessary for proper performance of all gypsum wallboard fasteners.

1. Framework shall meet the minimum requirements of FHA and local building codes.

2. Framing members shall be straight, true, of uniform dimension, and framing shall be properly aligned.

3. All framing lumber shall be of a good grade for the intended use, and 2″ x 4″ nominal size or larger shall bear the grade mark of a recognized inspection agency using grading rules for lumber recommended to American Lumber Standards Committee.

4. All framing lumber shall have a moisture content not in excess of 15% at time of gypsum wallboard applications.

5. Do not attach gypsum wallboard to extremely soft framing members.

Failure to observe these minimum framing requirements, which are applicable to screw, nail and adhesive attachment, will materially increase the possibility of ineffective fastening concealment, due to warping or dimensional changes. This is particularly true if framing lumber has greater than normal tendencies to warp or shrink after erection.

Heating and Ventilation Recommendations: framing should approach as closely as possible the moisture content it will reach in service by allowing the building, after it is enclosed, to stand as long as possible prior to the application of the gypsum wallboard. Provide heat in winter or during damp conditions at a uniform temperature in the range of 50° to 70°F. Provide ventilation to remove excess moisture.

general drywall specifications

notes to architect

The following comments and recommendations cover the basic specifications for normal job requirements, and are intended as minimum guide specifications which can be adapted to specific projects and conditions.

Detailed specifications on the various drywall systems are covered in pertinent USG Systems Folders. Other related job conditions should be covered in the plans, details, or specifications.

It is not intended that these specifications shall cover every possible design or job condition, but rather to assist in the preparation of specifications applicable to a given project.

For drywall joint treatment specifications, see USG Folder f-1887.

For painting specifications, see USG Folder f-1917.

For gypsum sheathing specifications, see USG Folder f-1897.

When Back-Blocking or Floating Interior Angle construction is to be specified, see specifications in USG Folder a-1387.

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I. scope—Furnish all labor, materials and equipment to surface all interior walls and ceilings with gypsum wallboard, in accordance with specifications and drawings.

II. general provisions—In cold weather the building shall be heated and ventilated during application of gypsum wallboard.

III. materials—All materials herein specified shall be by the UNITED STATES GYPSUM COMPANY unless otherwise indicated.

a. Gypsum Wallboard shall be, in lengths as long as practical to minimize number of joints:

(SHEETROCK* gypsum wallboard (thickness)—Tapered Edge Regular, FIRECODE,* FIRECODE "C", Insulating).

(SHEETROCK Vinyl Panel Wallboard) (type) (color or pattern).

(ULTRAWALL* Panels) (pattern or color).

(SHEETROCK W/R Gypsum Wallboard) (type) (thickness).

b. Gypsum Coreboard shall be: USG Coreboard (length).

c. Gypsum Studs shall be: USG Gypsum Studs.

d. Gypsum Backing Board shall be: BAXBORD* (Regular) (FIRECODE) (Insulating) (thickness) (width).

e. Acoustical Tile Base shall be: BAXBORD (Regular) (FIRECODE) (Insulating) (thickness).

f. Corner Reinforcement shall be: (PERF-A-BEAD* No. 100) (DUR-A-BEAD* No. 101, 102, 103) (ECONO Standard, No. 102, 103, 104).

g. Metal Trim shall be: USG Metal Trim No. (200-A ½″ or ⅝″, 200-B ½″ or ⅝″, 200-C, 300, 301, 400, 401 or 402).

h. Corner and Joint Moldings shall be: SHEETROCK Moldings to match specified finishes of (ULTRAWALL Panels) (SHEETROCK Vinyl Panel Wallboard).

i. Resilient Channels shall be: RC-1 SHEETROCK Resilient Channel.

j. Metal Studs shall be: USG Metal Studs (length) No. 158, 212, 358 or 400.

k. Metal Runners shall be: USG Metal Runners No. 158, 212, 358, 400, or L-shaped.

l. Metal Furring Materials shall be: (USG Metal Furring Channels and Clips) (USG Adjustable Wall Furring Brackets) (USG Cold-Rolled Channels ¾″, 1½″ or 2″).

m. Metal Base shall be: USG 2½″ Metal Base with (USG Splice Plates) (USG Flush Base Trim).

n. Drywall Screws shall be: (length) USG Drywall Screw Type (S, S-12, W or G).

o. Drywall Nails shall be: (length) (type) (or USG Matching Color Nails to match finish of ULTRAWALL or SHEETROCK Vinyl Wallboard panels).

p. Control Joints shall be: USG Control Joint No. 093.

q. Drywall Adhesives shall be: (PERF-A-TAPE* Joint Compound) (USG Laminating Adhesive) (SHEETROCK Brand DWA-10 or DWA-14 Adhesive).

r. Wallboard Sealant for SHEETROCK W/R Gypsum Wallboard shall be: SHEETROCK Brand W/R Sealant.

s. Joint Treatment shall be: (see Specifications in USG Folder f-1887).

IV. erection of gypsum wallboard

a. Basic single-layer system, treated joints

1. All ends and edges of all gypsum wallboard shall occur over nailing members, except when joints are at right angles to framing members as in horizontal application or when the end joints are to be back-blocked.

2. SHEETROCK Wallboard shall be applied first to the ceiling and then to the walls. To minimize end joints, use wallboard of maximum practical lengths. Boards shall be brought into contact, but shall not be forced into place. Where ends or edges abut, they shall be neatly fitted.

End joints shall be staggered. Joints on opposite sides of a partition shall be so arranged as to occur on different studs.

3. Wallboard shall be attached to framing supports by: (Standard Single Nailing Method) (Adhesive—Nail-On Method) (Double Nailing Method) (Power-driven USG Drywall Screws). Fasteners shall be spaced not less than ⅜″ from edges and ends of wallboard. Fasteners on all framing members shall be spaced and driven as recommended for specified fastening method. Nails shall not be staggered on adjoining edges or ends. Screws shall be staggered on adjoining edges or ends.

While the fasteners are being driven, the wallboard shall be held in firm contact with the underlying support. Attachment should proceed from central portion of the wallboard toward ends and edges. When nails are used for attaching gypsum wallboard, the nails shall be driven home with the heads slightly below the surface of the gypsum wallboard, in a dimple formed by the crowned face of the driving tool striking the last blow. A nail set shall not be used, and care shall be taken to avoid breaking the paper face.

4. When necessary to cut ends, edges, scribe or make cutouts within the field of the wallboard, it shall be done in a workmanlike manner.

5. All joints, screw head and other depressions in the surface of the wallboard shall be treated in the recommended manner with (PERF-A-TAPE*) (PERF-A-TAPE Ready-Mixed) (DURABOND*) Joint System.

All internal and external angles formed by the intersection of either wallboard surfaces or other surfaces shall be treated with USG metal trim or PERF-A-TAPE Joint System in accordance with the drawing details.

All vertical or horizontal external corners shall have PERF-A-BEAD or DUR-A-BEAD Corner Reinforcement as specified, applied in accordance with manufacturer's directions.

(**Multi-layer systems:** see pertinent USG systems folders).

b. SHEETROCK W/R Gypsum Wallboard

1. Framing members shall be plumb and true. If necessary, furr out studs around tub enclosure and shower stall so that the inside face of the lip of the fixture will be flush with the face of the gypsum wallboard.

Appropriate blocking, headers, or supports shall be provided to support tub and other plumbing fixtures, and to receive soap dishes, grab bars, towel racks, or similar items as may be required. SHEETROCK W/R is designed for use on framing 16″ o.c. When framing is more than 16″ o.c., or when the gypsum wallboard base is to be surfaced with ceramic tile over ¼″ thick, suitable blocking shall be installed between the studs. One row of blocking shall be placed approximately 1″ above the top of the tub or receptor and another row at the mid-point between base and ceiling. Blocking not required on studs spaced less than 16″ o.c.

2. Shower pans, receptors, or tubs should have an upstanding lip or flange a minimum of 1″ higher than the water dam or threshold contained in the entry way to the shower, and should be installed prior to the erection of the gypsum wallboard.

3. SHEETROCK W/R (Water-Resistant) Wallboard shall be applied as a base for ceramic, metal, or plastic tile on all areas where tile is to be used as a finished surface, unless otherwise indicated.

a. Wallboard shall be applied horizontally with the factory (paper bound) edge abutting the top edge of a temporary wood strip (or nail spacer), which shall allow a minimum ¼″ space between the lip of the receptor, tub, or sub-pan and the gypsum wallboard.

b. Wallboard shall be fastened with nails 8″ o.c. maximum and screws 12″ o.c. maximum. Exception: Where ceramic tiles over ¼″ thick are to be used as a surfacing material, nails shall be spaced 4″ o.c. maximum and screws 8″ o.c. maximum. Alternately, SHEETROCK Brand DWA-14 Adhesive may be used in lieu of conventional nailing where tile ¼″ or less in thickness is used.

c. All cut edges, utility holes and joints, including those at all angle intersections, shall be treated with SHEETROCK Brand W/R Sealant prior to installation. Treat all fastener heads with sealant after installation.

d. In areas to be tiled, no joints or angles shall be taped with conventional wallboard joint systems.

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4. The tile adhesive shall be approved by the manufacturer of the surfacing material for use over gypsum wallboard. The recommended adhesive for ceramic tile shall comply with CS 181-52. Water-thinned tile mastics are not recommended.

Prior to the erection of tile, all openings around pipes, fixtures, etc., shall be caulked flush with waterproof, non-hardening caulking compound.

The tile installation shall prevent the passage of water to the backing material.

The tile shall then be applied down to the top edge of the shower floor surfacing material, return, or tub lip and installed so as to overlap the lip or return of the tub or receptor.

The tile shall be applied so as to completely cover the following areas:

a. over tubs without shower heads—6″ above rim of tub.

b. over tubs with showers—minimum of 5′ above rim or 6″ above height of shower head, whichever is higher.

c. shower stalls—minimum of 6′ above shower dam or 6″ above shower head, whichever is higher.

d. all jambs in shower stall shall be covered to a like height.

e. all areas extending beyond face of tub shall be covered a minimum of 4″ from required height to finished floor of bathroom (below rim of tub). Areas beyond an exterior corner are excluded.

Regardless of the type of tile used, the following precautions shall be taken:

a. All tile joints shall be completely and continuously grouted to prevent water penetration.

b. Nonsetting caulking compound shall be applied between wall surfacing materials and shower receptor flange or tub rim.

c. The angle between tub edge and surfacing material shall likewise be caulked.

5. Painting shall be done in accordance with the following recommendations:

a. prime coat—W/R Wallboard shall be sealed with a solvent-thinned conventional wallboard primer-sealer or SHEETROCK Sealer.

b. finish coat—For finish or decorative coats, solvent-thinned enamels, semi-gloss or full gloss, shall be applied.

6. In moist areas where wallpaper is desired, priming as per 5, a, above, is recommended. The primed surface shall be properly sized for good adhesion of wallpaper to primer.

7. In areas where sound transmission control is desired, the wall must be treated the same as for regular wallboard. However, resilient suspension of the board is not recommended where tile is to be applied.

c. Lamination of SHEETROCK Wallboard to PYROBAR* Partition Tile

Wall size shall be mixed as prescribed by manufacturer, applied in one coat over entire surface of the PYROBAR partition, and allowed to dry at least 24 hours. Face boards shall be cut to allow continuous clearance (⅛″ to ¼″) at the floor. SHEETROCK Brand DWA-14 Laminating Adhesive shall be applied in four beads 16″ o.c., parallel to the long dimension of the board, to the back of each wallboard panel.

Panels shall be positioned vertically over the PYROBAR tile and pressed into place to insure adequate bond. At third points along vertical joints, and mid-points of the 4-ft. width, panels shall be temporarily nailed, nails to be removed after adhesive dries (approx. 48 hours). With SHEETROCK Vinyl or ULTRAWALL Panels as face boards, shoring shall be used in place of temporary nailing.

Standard finishing procedure of single-layer SHEETROCK wallboard application shall be followed.

d. Lamination of SHEETROCK Wallboard to monolithic concrete and unit masonry

The masonry or concrete shall be clean, smooth and dry prior to application. If wood base is to be used, wood nailer shall be attached to the wall before lamination is started. Face boards shall be cut to allow continuous clearance (⅛″ to ¼″) at the floor. Beads of PERF-A-TAPE Joint Compound (embedding type) shall be applied to back of wallboard parallel to long dimension of the board, as prescribed by manufacturer.

Panels shall be positioned vertically over the masonry or concrete surface and pressed into place to develop full adhesive contact. Bracing of face panels shall be provided until the adhesive dries, to consist of (1) 2x4's centered vertically over abutting long edges of wallboard and at center board as required, angle bracing at horizontal midpoint; (2) concrete nails at top and bottom of face panels and elsewhere as required to achieve complete wallboard bond to concrete or masonry.

Standard finishing procedure of single-layer SHEETROCK wallboard application shall be followed.

Lamination of SHEETROCK Vinyl Wallboard, lamination to interiors below grade or directly to interior surfaces of exterior walls, and lamination where exposure to moisture is extreme or continuous, are not recommended in this construction.

V. attachment of metal moldings—Installation shall start from corner or door, from plumb and level starting points. Moldings shall be nailed with flat head wire nails 8″ to 12″ o.c. Place divider on panel before erection; nail exposed side of divider, then insert butting panel. At inside corners, erect first panel, then apply molding and insert second panel. When cap molding is used to finish wainscoting, nail cap loosely at lower end of provided slot so that molding is slightly above panel height; apply panel to wall, tap cap molding into position. At outside corners, place molding over one panel at corner, nail exposed side, then insert next corner panel.

VI. erection of RC-1 Resilient Channel—RC-1 SHEETROCK Resilient Channels, spaced 24″ o.c., shall be installed at right angles to wood framing spaced 16″ or 24″ o.c., with screw fasteners, providing approximately 1″ penetration into the framing member, driven through the punchholes provided in the attachment flange. The resilient channel shall be spliced directly over a framing member, with both attachment flanges fastened to the stud.

At the horizontal ceiling angle the resilient runner at the top of the sidewall shall be placed a maximum of 6″ from the ceiling line with the attachment flange downward and attached to the face of the vertical studs. The lowest RC-1 channel shall extend to the floor line.

Single layer ½″ or ⅝″ SHEETROCK gypsum wallboard is screw-applied with the long dimension parallel with the resilient channel. The horizontal abutting edges shall be centered over the screw flange of the channel. Attach the gypsum board with 1″ USG Drywall Screws Type S spaced 12″ o.c. along the channels.

The RC-1 Channels shall be extended into all corners and connected to the studs which frame the corners. A maximum 6″ cantilever of the channel is permissible.

VII. erection of metal studs, runners—Runners shall be aligned accurately at floor and ceiling and securely anchored with suitable fasteners spaced not more than 24″ o.c.

Studs shall be positioned vertically in the runners, spaced no greater than (16″) (24″) o.c. Anchor all studs located adjacent to door and window frames, partition intersections, and corners to runner flanges with Metal-lok Fastener or by positive screw engagement through each stud flange and runner flange. When necessary, studs shall be securely spliced with a minimum 8″ nested lap in which 1 screw per stud flange is required.

Studs shall be located no more than 2″ from all door frame jambs, abutting partitions, partition corners and other construction. Studs shall be securely anchored to the jamb and head anchor clips of each door or borrowed light frame.

VIII. erection of metal furring channels, brackets

a. USG Metal Furring Channels shall be attached to masonry or concrete surfaces, either vertically or horizontally, at max. 24″ centers.

b. Where Metal Furring Channel is installed to exterior walls and there is a possibility of water penetration through the walls, install an asphalt felt protection strip between the USG Furring Channel and the wall surface.

c. Where USG Metal Furring Channel Clips are used for attaching Furring Channels to 1½″ main carrying channels, the following erection procedures shall apply:

1. Clips shall be installed on alternate sides of the 1½″ carrying channels.

*Reg. U.S. Pat. Off.

2. In areas where clips cannot be alternated (such as light troffers, air diffusers, any other type ceiling opening, intersecting walls, etc.) the USG Metal Furring Channel shall be wire-tied to the 1½″ carrying channel.

3. Where ceiling openings exist, and acoustical tile is to be adhesively applied over screw-attached gypsum wallboard, then bracing equal to ¾″ C. R. Channels shall be securely wire-tied atop and perpendicular to the 1½″ carrying channels at 48″ o.c. maximum, to prevent rotation of carrying channels at these openings.

d. USG Adjustable Wall Furring Brackets, with serrated edges up, shall be attached to the masonry walls not over 4″ from columns or other abutting construction and not over 36″ o.c. horizontally and as required above and below windows. The wall furring brackets shall also be spaced 48″ o.c. vertically for support of the ¾″ Cold-Rolled Furring Channels. Also the vertical spacing of the Wall Furring Bracket and ¾″ Cold Rolled Furring Channels shall not be more than 6″ from the floor and ceiling.

e. The USG Metal Furring Channel shall be erected vertically and wire tied with a double strand of 16-ga. galvanized tie wire at the junction of each ¾″ channel. Channels shall be spaced at (16″ o.c. for ⅜″ wallboard) (24″ o.c. for ½″ or ⅝″ wallboard) maximum.

IX. installation of metal base—USG* Metal Base shall be notched to a neat miter in forming all angles. In continuous runs, ends shall be evenly butted and internally spliced with USG Splice Plates. On fire-rated partitions using metal base, the floor runner shall be grouted.

X. installation of control joints—where indicated on drawings, USG Control Joints shall be attached with Bostitch 9/16″ "G" staples or equal spaced not over 6″ apart in each flange. End joints shall be cut square, butted together and aligned for neat fit. Protective tape shall be removed when joint treatment is completed.

XI. application of fasteners and adhesives

a. (length) USG Drywall Screws (type) shall be power-driven with an electric screw driver, and screw heads shall provide a slight depression below the surface of the wallboard. Screws shall not be driven closer than ⅜″ from edges and ends of the board. (Specify spacing.)

b. Nails shall conform with "Recommended Performance Standards for Nails for Gypsum Wallboard," adopted by the Gypsum Association and the Gypsum Drywall Contractors International, or as follows:

1. Fire-resistive constructions with—
½″ SHEETROCK* FIRECODE* Wallboard—5d Gypsum Wallboard type, 15/64″ flat head, 13½ ga., medium diamond point.

⅝″ SHEETROCK* FIRECODE* Wallboard—6d Gypsum Wallboard type, ¼″ flat head, 13 ga., medium diamond point.

2. ULTRAWALL* Panels application—1⅛″ or 1⅞″ USG Steel Nails, matching color.

3. SHEETROCK Vinyl Panel Wallboard application—1⅜″ USG Brass Nails, matching color.

c. Adhesive shall be mixed and applied in accordance with manufacturer's directions, and as follows:

1. PERF-A-TAPE* Joint Compound (embedding type) or USG Laminating Adhesive shall be applied in the prescribed manner to the back of face boards to be laminated. Face boards shall then be laminated to (base layer boards) (coreboard) using moderate pressure and temporary nailing or shoring to insure adequate bond.

2. SHEETROCK Brand DWA-14 or DWA-10 Adhesive shall be applied in a continuous ⅜″ bead at the center of attachment to the face of framing members. Where two pieces of wallboard meet on a framing member, apply a serpentine bead, permitting contact to both panels. Repeat this pattern every 8″. Do not apply adhesive to members such as bridging, diagonal bracing, etc., into which no supplemental fasteners will be driven. Immediately following contact of wallboard to adhesive, apply necessary fasteners (specify type and spacing).

For fire ratings, sound transmission loss data and comparative cost range, see USG Construction Selector.

*Reg. U.S. Pat. Off.

U.S.G. SALES OFFICES: **ALABAMA:** Birmingham, 871-6136 • **ARIZONA:** Phoenix, 274-5461 • **CALIFORNIA:** Fresno, 233-1102; Los Angeles, 338-1171; Los Angeles (So. Calif.), 665-5721; San Leandro, 569-3020; Sacramento, 443-1989; San Diego, 295-5191 • **COLORADO:** Denver, 388-6301 • **CONNECTICUT:** Hamden, 288-1607 • **FLORIDA:** Jacksonville, 359-1628; North Miami, 754-4553 • **GEORGIA:** Atlanta, 231-3180 • **ILLINOIS:** Chicago, 321-5861; Peoria, 682-5478 • **INDIANA:** Indianapolis, LI 6-4775 • **KENTUCKY:** Louisville, 895-9478 • **LOUISIANA:** New Orleans, 822-0482 • **MARYLAND:** Baltimore, DR 7-8001 • **MASSACHUSETTS:** Cambridge, 491-6318 • **MICHIGAN:** Southfield, 357-2000; Grand Rapids, 456-8611 • **MINNESOTA:** Minneapolis, WA 7-9911 • **MISSOURI:** Kansas City, WE 1-1388; Clayton, PA 1-1133 • **NEBRASKA:** Omaha, 551-6166 • **NEW JERSEY:** Clifton, 472-3900 • **NEW MEXICO:** Albuquerque, 268-2457 • **NEW YORK:** Albany, IV 9-2559; Buffalo, 854-3427; De Witt, 446-1291; Hempstead, 485-9233; New York, 935-4460 • **NORTH CAROLINA:** Charlotte, 332-5023; Raleigh, 828-5441 • **OHIO:** Cincinnati, 961-4300; Cleveland Heights, 321-4141; Columbus, 486-5981 • **OKLAHOMA:** Oklahoma City, JA 5-6645 • **OREGON:** Portland, 227-2518 • **PENNSYLVANIA:** Harrisburg, 234-3251; Bryn Mawr, LA 5-7630; Pittsburgh, 561-4600 • **TENNESSEE:** Memphis, 324-3796; Nashville, 254-1928 • **TEXAS:** Dallas, FL 1-5386; Houston, JA 4-7448; San Antonio, TA 4-4534 • **UTAH:** Salt Lake City, 359-3751 • **VIRGINIA:** Arlington, 525-3301; Richmond, 359-4008 • **WASHINGTON:** Seattle, 633-0745; Spokane, MA 4-3311 • **WISCONSIN:** Milwaukee, BR 6-5672.

USG® Drywall Joint Treatment Products

f

1887

A.I.A. File No. 23-M/23-J

description and utility

The spectacular growth of gypsum wallboard's use in building is due largely to the development and improvement of joint-finishing methods. In order to present smooth, continuous surfaces in interior walls and ceilings, the joints between wallboard panels must be reinforced and concealed and fastener heads must be covered.

United States Gypsum was the originator of modern joint treatment, and through constant improvement its products have remained predominant in the field. PERF-A-TAPE* and other joint treatment products by U.S.G. have wider acceptance than all others for one reason: their over-all qualities produce the best, most uniform finished result.

Today's complete USG joint treatment line includes both ready-mixed and powder-type joint compounds, finishing or topping compounds, fiber reinforcing tape suitable for application by either hand tools or mechanical taping tools, new one-day joint system, special concrete finishing compound, laminating adhesive, and compounds for use with electric radiant heat cable installations. In addition to conventional joint finishing and fastener spotting (see "Types and Functions"), certain of these products are designed for repairing cracks, patching, spackling, back-blocking, and for laminating layers in gypsum wallboard double-layer systems.

In USG, PERF-A-TAPE and DURABOND* Joint Systems, these qualities of superiority have been developed:

Excellent Bond—compound holds tight, providing secure bond between tape and face paper of wallboard.

Reduced Ridging—joints harden out smoother; low shrinkage and tight cohesion reduce sanding to minimum, allow faster preparation for decorating.

Smooth Working—easy mixing, excellent slip, ample wet mix life, and no alkali burning of paint.

In PERF-A-TAPE Reinforcing Tape, both comparative tests and long field usage have established these performance advantages:

Strength—greatest cross tensile strength, as strong as the board itself.

Crack Resistance—chamfered edges are wafer-thin for easy embedding, greater holding power to resist edge cracking.

Natural Bond—spark perforations prevent harmful air pockets and photographing; tape has least longitudinal stretch of all types tested; is pre-creased for easier folding.

Use of USG joint treatment brings the important added advantage of dealing with a single manufacturer who is responsible for all components of the finished wall or ceiling—gypsum wallboard, joint compound, reinforcing tape, drywall screws and adhesives, paints, metal studs and other steel accessories—all made by U.S.G. to *work together*.

SHEETROCK* Gypsum Wallboard and accessories are covered in USG Folder f-1877; use of joint treatment products in specific assemblies is treated in pertinent USG System Folders. USG Paint Products, including spackling and surface preparation materials, are covered in USG Folder f-1917.

general limitations

1. For interior use only; not intended for use on wood or wood fiber products (except in certain lamination applications —see PERF-A-TAPE Joint Compound below).
2. Bagged and cartoned products require protection against wetting.

3. Each compound coat must be dry before next is applied, and completed joint treatment must be thoroughly dry before proceeding with decoration.

types and functions

PERF-A-TAPE Joint System consists of PERF-A-TAPE Compound (powder type) and PERF-A-TAPE Reinforcement (fiber tape), available either in one package or separately (below). For estimating purposes: for 1,000 sq. ft. of surface area to be finished, approximately 370 lin. ft. of PERF-A-TAPE Reinforcement and 50 lbs. of powder-type or 5 gals. of ready-mixed type PERF-A-TAPE Joint Compound are required.

PERF-A-TAPE Reinforcement is a strong fiber tape specially designed with chamfered edges feathered thin. Special cross-fibered paper has great strength both with the grain and against grain of paper. Many small random perforations allow rapid air escape during embedding. Highly crack resistant. Available in rolls.

Uses: outstanding performance when used with companion products for joint reinforcement on gypsum wallboards—either PERF-A-TAPE Joint Compound, USG All Purpose Ready-Mixed Joint Compound, or DURABOND One-Day Joint System.

A.I.A. File No. 23-M/23-J

*Reg. U.S. Pat. Off.

PERF-A-TAPE Joint Compound is the standard of excellence among products used primarily for embedding tape, and the most widely used of all joint treatment preparations. Supplied in powder form, it has superior qualities of tight bonding, easy mixing, smooth working, edge and check crack resistance, outstanding durability. Special formula minimizes paint discoloration and discoloration from vapor and gas burner gases in air; no priming necessary with paints which have good resistance to suction differences.

Uses: for hand or mechanical application on interior joints, corners and fastener heads; should be followed by PERF-A-TAPE Topping Compound (below) for finishing. Used with PERF-A-TAPE Reinforcement in repairing cracks in plaster surfaces. Also recommended for spreader application as laminating compound in double-layer gypsum drywall and in laminating SHEETROCK* Wallboard to USG Sound Deadening Board; requires temporary nailing. Used as adhesive for backing blocks in USG Back-Blocking Joint Reinforcement System (see USG Folder a-1387).

PERF-A-TAPE Topping Compound is the companion product used for finishing over PERF-A-TAPE Joint Compound. Preferred for its smoothness, paintability and long working life. Latest improvements provide better slip and feathering, reduced shrinkage, easier sanding, and superior bonding. Has no "built in" factors to contribute to discoloration of paint from vapors or gases. Supplied in powder form, pigmented or unpigmented.

Uses: for second and third coat work, fine finishing of joints after reinforcing tape embedment; also for nailhead concealment. **Limitations:** not recommended for use in embedding, or for direct application to metal bead.

USG All Purpose Ready-Mixed Joint Compound is widely specified because of uniform joint results it produces on the job. Comes pre-mixed, hence not subject to variation in mixture of water required for powder-type compounds. It has a creamy, lump-free plasticity that produces excellent slip and bond, extra-smooth embedding and finishing—latest improvement in an all-purpose ready-mixed product which was first introduced in 1954. Requires minimum sanding, eliminates contamination resulting from dirty water. Available in either machine or hand tool consistency. On-the-wall cost averages the same as with powder compounds.

Uses: excellent for embedding tape, smooth finished joints, nailhead spotting; used with PERF-A-TAPE Reinforcement in repairing cracks in interior plaster and masonry not subject to moisture. **Limitations:** container must be protected from freezing; not recommended for laminating in double-layer application of wallboard.

DURABOND* Joint Compound is the newest U.S.G. development to cut drying time and reduce shrinkage—ideal for applications where early occupancy is important or where slow drying conditions exist. A powder product mixed with water, it chemically hardens in 3 to 4 hours, thus permits same-day finishing with DURABOND Topping Coat or USG Ready-Mixed Joint Compound and usually next-day decoration. Reduces mixing and clean-up time to result in lower applied costs than competitive one-day compounds—also produces better bond, fewer blisters. Suitable for hand or mechanical application; edge and check crack resistant. Faster hardening formulations also available.

Uses: for embedding PERF-A-TAPE Reinforcement and as first fill coat, also for concealing nailheads or screws. Used directly over DUR-A-BEAD* and PERF-A-BEAD* Corner Reinforcement (see USG Folder f-1877). Also employed as filler and adhesive in drywall radiant heat ceiling systems. **Limitation:** not to be used as finishing coat; must in all cases be completely covered with final application of DURABOND Topping Coat or USG All Purpose Ready-Mixed Joint Compound.

DURABOND Topping Coat is a new powdered vinyl finishing compound developed as the matching product for DURABOND Joint Compound. Substantially reduces cost of using one-day joint systems, normally ready for use immediately after mixing. Easily mixed by either manual or mechanical means, exceptionally smooth working, simplifies sanding.

Uses: as final or skim coat over DURABOND Joint Compound, and as alternate for this purpose to USG All Purpose Ready-Mixed Joint Compound.

*Reg. U.S. Pat. Off.

USG® Laminating Adhesive is an improved type of dry powder adhesive for job laminating of double-layer gypsum drywall. Mixed with water, it provides an excellent bond and levels minor misalignments. Applied with notched hand spreader (illustrated above) or mechanical tool in ribbons of adhesive 2″ apart, over entire back surface of face-layer board. Not a "contact" adhesive, it requires temporary nailing of prepared face layer to base layer.

Uses: for lamination of SHEETROCK* Gypsum Wallboard face panels to base layer of either SHEETROCK Wallboard or BAXBORD* Gypsum Backing Board, in double-layer interior walls and ceilings. (Note: two other USG drywall adhesives are available for adhering gypsum wallboard directly to wood framing. See USG Folder f-1877 for SHEETROCK Brand DWA-14, and DWA-10 adhesives.)

COVER COAT compound is designed for filling and smoothing concrete surfaces located above grade. Supplied in ready-mixed form (sand can be added), easily applied with drywall tools in two or more coats. Dries to a fine white surface usually making further decoration unnecessary. If surface must be decorated, COVER COAT is followed with SHEETROCK Sealer or TEXOLITE Primer-Sealer.

Uses: for coating and finishing above-grade concrete ceilings and columns; also as fill and finish coat over electric radiant heat ceiling cable not to be faced with final layer of gypsum wallboard. **Limitations:** not to be applied over moist surfaces or surfaces likely to become moist (by condensation or otherwise), on ceiling areas below grade, on surfaces which project outside the building, or on other areas which might be subject to moisture, freezing, efflorescence, pitting or popping, movement, or other abnormal condition.

general joint treatment specifications

notes to architect

The following comments and recommendations cover the basic specifications for normal job requirements, and are intended as minimum guide specifications which can be adapted to specific projects and conditions.

Detailed specifications on joint treatment and adhesive application in the various partition and ceiling assemblies are covered in pertinent USG Systems Folders. Other related job conditions should be covered in the plans, details, or specifications.

I. scope—Unless otherwise indicated, all walls, partitions and ceilings are included. Furnish all labor and material necessary to reinforce and conceal all joints between gypsum wallboard panels in accordance with specifications and drawings. (If DUR-A-BEAD*, PERF-A-BEAD* or PERF-A-TRIM* corner reinforcement is specified) furnish all labor and material required to finish all corners as may be shown on drawings.

II. general provisions—In cold weather, the building shall be heated sufficiently to maintain a uniform temperature in the range of 55° to 70° F. during joint treatment application, and adequate ventilation shall be provided when application is completed, either by means of opened windows or temporary circulators. When required, heat is to be furnished by (insert contractor's name here).

III. materials—All materials herein specified shall be manufactured by the United States Gypsum Company, and used in strict accordance with the manufacturer's directions.

a. Joint System shall be: PERF-A-TAPE Joint Reinforcement used with (select one of following)—

(*1*) USG All Purpose Ready-Mixed Joint Compound—machine or hand tool consistency—for embedding, fill and finishing.

(*2*) PERF-A-TAPE Joint Compound for embedding, PERF-A-TAPE Topping Compound—pigmented or unpigmented—for fill and finishing.

(*3*) DURABOND* Joint Compound for embedding and fill coat, DURABOND Topping Coat for finishing.

(*4*) DURABOND Joint Compound for embedding and fill coat, USG All Purpose Ready-Mixed Joint Compound for finishing.

b. Laminating Material shall be:

(USG Laminating Adhesive)

(PERF-A-TAPE Joint Compound)

c. Concrete Finishing Compound shall be: COVER COAT Compound (as ready-mixed) (with sand additive).

d. Electric Radiant Heat Cable Filler shall be:

(DURABOND Joint Compound used as cable filler and laminating adhesive prior to application of final gypsum wallboard surface)

(COVER COAT Compound used as hollow fill and finish coats to be left exposed)

IV. application—joint compound

a. PERF-A-TAPE Joint Compound and Topping Compound shall be mixed and used in accordance with manufacturer's recommendations as shown on the bag. (USG All Purpose Ready-Mixed Joint Compound shall be used as it comes in original container.)

b. Wall and ceiling angles and inside vertical corner angles shall be reinforced with PERF-A-TAPE Reinforcement folded to conform to the adjoining surfaces and to form a straight, true angle. Using a suitable tool or machine, a thin uniform layer of PERF-A-TAPE Joint Compound embedding type, or USG All Purpose Ready-Mixed Joint Compound, approximately 3″ wide, shall be applied under and over the tape in the angle joint to be reinforced. In angles and over all other joints to be reinforced, the PERF-A-TAPE Reinforcement shall be centered and seated into the compound, leaving sufficient compound under the tape to provide proper bond. A skim coat of compound shall be applied immediately after embedding tape. Excess compound shall be cleaned from the surface of the wallboard, After drying, embedding compounds shall be covered with fill coat of PERF-A-TAPE Topping Compound or USG All Purpose Ready-Mixed Joint Compound.

The final coat shall be spread evenly over and slightly beyond the edge of the preceding coat and feathered with a smooth uniform finish. All dimples at fastener heads shall receive three coats of compound in succession as used on the joints.

All coats shall be allowed to dry thoroughly (minimum of 24 hours) between each application of compound. All coats shall be sanded after each application has dried. The final coats and subsequent sanding shall leave all gypsum wallboard and treated areas uniformly smooth and ready to receive decoration.

*Reg. U.S. Pat. Off.

c. DURABOND Joint System shall be applied as specified for the PERF-A-TAPE system (IV, b, above) with the following exceptions:

DURABOND fill coat may be applied before either hardening or drying is complete in the embedding coat. (Fill coat also may be applied after the embedding coat is hardened.) After fully hardened (hardens in 3 to 4 hours), (DURABOND Topping Coat or USG All Purpose Ready-Mixed Joint Compound) shall be used for the finishing coat.

d. (If DUR-A-BEAD* corner reinforcing is used) flanges of all DUR-A-BEAD metal corner reinforcing shall be concealed by at least two coats of compound. The first coat shall be (PERF-A-TAPE Joint Compound, DURABOND Joint Compound, or USG All Purpose Ready-Mixed Joint Compound). Second coat may be either PERF-A-TAPE Joint Compound or PERF-A-TAPE Topping Compound; DURABOND Topping Coat or PERF-A-TAPE All Purpose Ready-Mixed Compound. When completed, the compound shall extend approximately 8″ to 10″ on either side of the exposed metal nosing.

(If PERF-A-BEAD* corner reinforcing is used) PERF-A-BEAD shall be furnished, applied and concealed in accordance with the manufacturer's directions.

(If PERF-A-TRIM* reinforcing is used) PERF-A-TRIM shall be finished in accordance with the manufacturer's directions.

V. application—laminating adhesive

(USG Laminating Compound or PERF-A-TAPE Joint Compound embedding type) shall be applied in the prescribed manner to the back of face boards to be laminated. Face boards shall then be laminated to (base layer boards or coreboard) using temporary fasteners, shoring or weighting until adhesive is dry, to insure adequate bond.

See USG Folder f-1877 for specifications on other adhesives.

VI. application—COVER COAT

COVER COAT shall be applied to concrete (ceiling) (columns) before internal partitions are erected. All concrete surfaces to be coated shall be free of dirt, dust, grease and other contaminants. Any metal on the surface shall be coated with a rust preventative paint and allowed to dry.

Mixing, thinning and application shall follow manufacturer's directions. Irregularities in the surface shall be filled, chiseled or ground off as necessary to bring flush to concrete surface, prior to application of first coat. Surface shall be sanded after each coat has dried for at least 24 hours. Sufficient coats shall be applied to obtain acceptable result.

Angles formed between top of partitions and ceiling shall be finished with (COVER COAT and PERF-A-TAPE Reinforcing Tape) (PERF-A-TAPE Joint System) (DURABOND Joint System) (USG All Purpose Ready-Mixed Joint Compound). Where further decoration is required, surface shall be sealed with (SHEETROCK Sealer) (TEXOLITE Primer-Sealer).

a. On concrete columns, PERF-A-BEAD Corner Reinforcement shall be applied to angles and corners where required, while first coat of COVER COAT is still wet and fluid. PERF-A-BEAD shall be applied according to manufacturer's directions, and both flanges shall be covered with a smooth fill of COVER COAT 3″ to 4″ wide.

VII. application—cable filler in electric radiant heated ceilings

a. DURABOND Joint Compound as cable filler and laminating adhesive in double-layer gypsum wallboard electric heat ceilings—see specifications in USG Folder a-1397.

b. DURABOND Joint Compound as filler and COVER COAT Compound as exposed finish coat in single-layer gypsum wallboard electric heat ceilings—see specifications in USG Bulletin J-7.

*Reg. U.S. Pat. Off.

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USG® Sheathing Products gypsum and insulating

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1897

A.I.A. File No. 19-D-3/37-B

description and utility

United States Gypsum manufactures two outstanding products for sheathing exterior walls over wood framing or nailable steel studs:

—FIRECODE* Sheathing, with an asphalted gypsum core
—USG Insulating Sheathing, a rigid wood fiber board

Both provide a top-quality base for a wide range of exterior finishes—wood clapboard or aluminum siding, masonry veneer, wood and asbestos shingles, and stucco. They are widely specified for garden apartments and light commercial construction as well as for single residences. The two sheathings have these features in common:

Weatherproof Joints—available with either T & G or square edges, tight joints minimize wind and rain infiltration; no back-up paper necessary.

Low Applied Cost—because both sheathings are quickly cut or scored and snapped, waste is negligible from the large 2′ x 8′, 4′ x 8′ and 4′ x 9′ sheets. Low material and labor costs are the result.

Strength, Rigidity—superior to other types in bracing and stiffening strength. In recognized tests, FIRECODE Sheathing showed lateral distortion of less than ½″ under a racking load of 1850 lbs.; 25/32″ USG Insulating Sheathing showed a rigidity factor of 3.0 compared to 1.0 for horizontal wood sheathing. Both USG sheathings are available in types which

Comparative "U" Factors of Exterior Wall Assemblies

exterior finish and type of sheathing	Regular SHEETROCK wallboard 3/8″	Regular SHEETROCK wallboard ½″	Insulating SHEETROCK wallboard 3/8″	Insulating SHEETROCK wallboard ½″	ROCKLATH plaster base and ½″ plaster plain	ROCKLATH plaster base and ½″ plaster insul.
Wood Siding—with						
Wood Sheathing (1)	.25	.24	.17	.17	.24	.17
½″ Insulating Sheathing	.23	.22	.16	.16	.23	.16
25/32″ Insulating Sheathing	.20	.19	.14	.14	.19	.14
½″ Gypsum Sheathing	.28	.27	.19	.18	.28	.18
5/16″ Plywood	.29	.28	.19	.18	.28	.19
½″ Gypsum Sheathing —1½″ Wool	.11	.11			.11	
Common-Brick Veneer—with						
Wood Sheathing (1)	.25	.24	.17	.17	.25	.17
½″ Insulating Sheathing	.23	.22	.16	.16	.23	.16
25/32″ Insulating Sheathing	.20	.19	.14	.14	.19	.14
½″ Gypsum Sheathing	.29	.28	.19	.18	.28	.19
5/16″ Plywood	.29	.28	.19	.19	.29	.19
½″ Gypsum Sheathing —1½″ Wool	.11	.11			.11	
Stucco—with						
Wood Sheathing (1)	.29	.28	.19	.19	.29	.19
½″ Insulating Sheathing	.27	.26	.18	.18	.26	.18
25/32″ Insulating Sheathing	.22	.22	.16	.16	.22	.16
½″ Gypsum Sheathing	.35	.34	.21	.21	.34	.21
5/16″ Plywood	.36	.34	.22	.21	.35	.21
½″ Gypsum Sheathing —1½″ Wool	.12	.12			.12	
Asbestos Cement Shingles—with						
Wood Sheathing (1)	.29	.28	.19	.19	.29	.19
½″ Insulating Sheathing (2)	.27	.26	.18	.18	.26	.18
25/32″ Insulating Sheathing (2)	.22	.22	.16	.16	.22	.16
½″ Gypsum Sheathing (2)	.35	.33	.21	.21	.34	.21
5/16″ Plywood	.35	.34	.22	.21	.35	.21
½″ Gypsum Sheathing —1½″ Wool (2)	.12	.12			.12	

NOTES: All figures based on 1965 ASHRAE Guide. Second air space with brick veneer not considered in calculations. (1) Calculations include layer of building paper over sheathing. (2) Using 32″ or 48″ asbestos shingles—nailed through sheathing into framing spaced 16″ o.c.

are approved by FHA, VA and many building codes for use without diagonal corner bracing.

The consistently high quality of both sheathings brings the choice between them to the prime feature most desired: fire and moisture resistance for FIRECODE Sheathing, or integral insulating value for USG Insulating Sheathing.

The adjoining table will assist architects in comparing "U" factors and insulating efficiency of various wall assemblies; the smaller the "U" Factor, the smaller the heat loss. Assemblies using USG Insulating (wood fiber) Sheathing are compared with those using the combination of FIRECODE (gypsum) Sheathing plus THERMAFIBER* Insulating Wool, and both with those using wood or plywood sheathing. Interior finishes shown are SHEETROCK* Gypsum Wallboard and ½″ of plaster over ROCKLATH* Gypsum Plaster Base—both plain and insulating (foil back) types.

types and functions

1. FIRECODE Sheathing

description

FIRECODE Sheathing is a fireproof gypsum board with an asphalted gypsum core encased in specially formulated brown water-repellent paper on both sides and long edges. This paper actually sheds water for extra protection in storage and use.

It is made in two types: **24″ wide, 8′ length,** with V-shaped tongue and groove long edges, normally applied horizontally; and **48″ wide, 8′ and 9′ lengths,** with square edges, applied vertically to meet FHA requirements for omission of let-in corner bracing in frame construction. Both are ½″ thickness, shipped bundled only, two pieces face to face.

function

Fire Protection—The gypsum core is incombustible and will not transmit high temperatures until completely calcined. FIRECODE Sheathing is the only commonly used type of sheathing that is fire resistant.

Weather Resistance—The sheathing's gypsum core is thoroughly intermixed with asphalt emulsion, and the heavy brown paper covering is given a special water repellent treatment. This makes possible open storage on the job, and exposure on the framing during construction without appreciable loss of structural value—no harmful warping or buckling. Building paper not required except where local codes require building paper over all sheathing. Complies with water resistance requirements of ASTM C79-52 and Federal Specification SS-L-30B. Tests made on test panels showed water absorption of only 3.4% by weight for USG Sheathing, less than 1/12 the amount of water absorbed by typical wood sheathing under similar conditions.

A.I.A. File No. 19-D-3/37-B

*Reg. U.S. Pat. Off.

Insulation Value—FIRECODE* Sheathing possesses thermal conductance of 2.86 and thermal resistance of 0.35. When combined with THERMAFIBER* Insulating Wool blankets in the exterior wall assembly, it provides high insulation efficiency (see table, page 1) and economy because only the wall areas which require insulation—the stud spaces—are insulated.

Vapor Permeability—Has average permeability of 27.3 perms. Not a vapor barrier, it is designed to permit necessary escape of normal water vapor penetrating the stud space—thus minimizes rotting of framing. Most economical method of effective vapor control is combination of FIRECODE Sheathing with foil-backed types of SHEETROCK* Wallboard or ROCKLATH* Plaster Base, or with THERMAFIBER Silver Shield Insulating Wool.

Durability—Has been used on more than one million homes and other buildings; verified inspections have shown virtually no deterioration after 12 to 25 years of use, all without building paper. FIRECODE Sheathing can be used, exposed to weather, as economical siding for farm buildings, tobacco barns, construction sheds, warehouses—may be painted after six months exposure.

Economy—In addition to low material cost, FIRECODE Sheathing offers savings in application. One man can apply from 1,000 to 1,300 sq. ft. per day, usually at least 10% more productivity than with plywood or wood sheathing. Fewer nails per M are required for the 2′ x 8′ size than for any other type.

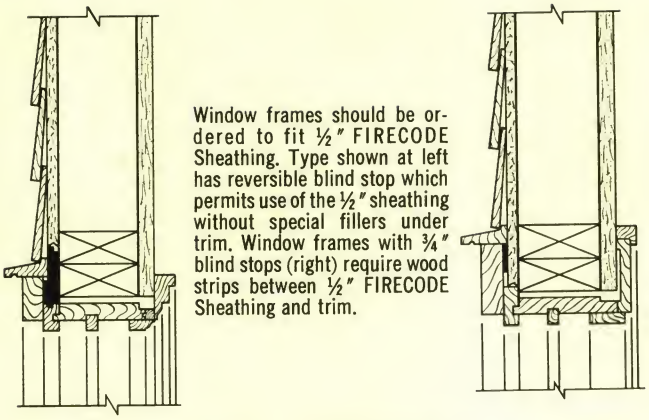
Structural Strength—In comparative tests, fully attested, FIRECODE Sheathing applied dry to an 8′ x 8′ panel of 2″ x 4″ framing on 16″ centers had a lateral distortion of .498″ under a racking load of 1,850 lbs. A similar panel was subjected to the equivalent of 5½ years of average U.S. rainfall and with the same load of 1,850 lbs. the distortion was only 1.125″. Under this same load a similar frame sheathed with 1″ x 8″ dry wood sheathing resulted in a distortion of 10.312″. See Racking Study table, right.

limitations

1. FIRECODE Sheathing is not to be considered a vapor barrier.
2. Maximum stud spacing—see table below.
3. Exterior finishes—wood siding, wood furring strips, stuccomesh, wall ties, etc.—must be secured to the framing members by nailing through the USG Sheathing.
4. Not recommended for interior uses. When a base for ceramic tile is required, SHEETROCK W/R Wallboard should be used (see USG Folder f-1877). When a base for adhesive application of ceiling tile is required, BAXBORD* Gypsum Backing Board should be used (see USG Folder b-1497).
5. With 2′ x 8′ FIRECODE Sheathing, diagonal corner braces should be installed at all external corners.

FIRECODE Sheathing—Types and Sizes

size	nom. thickness	type edge	max. framing spacing	approx. wt. per M sq. ft. (lbs.)	insul. value	meets Federal Specs.
2′ x 8′	½″	T & G	24″	2,000	.35(k)	SS-L-30B, Type Z SS-S-276
4′ x 8′	½″	Sq.	16″	2,000	.35(k)	ASTM C79 FHA Tech. Circ. No. 12
4′ x 9′	½″	Sq.	16″	2,000	.35(k)	(4′x8′and4′x9′sizesonly)



Window frames should be ordered to fit ½″ FIRECODE Sheathing. Type shown at left has reversible blind stop which permits use of the ½″ sheathing without special fillers under trim. Window frames with ¾″ blind stops (right) require wood strips between ½″ FIRECODE Sheathing and trim.

Racking Study—FIRECODE Sheathing

	at 1200-lb. load		at 2400-lb. load		
condition	deflection (in.)	set (in.)	deflection (in.)	set (in.)	maximum load (lbs.)
Dry	.089	.016	.230	.107	6000
Wet	.093	.032	.278	.130	4530

NOTES: Results cover panels without corner bracing sheathed with 4′x8′ USG Sheathing, ½″ thick. Based on averages of three panels tested at a nationally recognized testing laboratory.

2. USG Insulating Sheathing

description

USG Insulating Sheathing is the top-quality wood fiber product for sheathing wood-frame exterior walls—by far the most popular type of sidewall sheathing material, used in an estimated 50% of all single-family frame homes built with sheathing.

Treated in two ways for moisture resistance—asphalt coated and asphalt impregnated—USG Insulating Sheathing is available in three types: **Regular,** in 2′ and 4′ widths, ½″ and 25/32″ thicknesses, T & G, "V" and square edges; **Intermediate** (Corner Brace), of extra strength to normally eliminate need for bracing when applied vertically, in 4′ width, ½″ thickness, square edges; and **Nail Base** (Super-Strength), a high density sheathing exceeding FHA requirements for racking strength and holding power as a direct nailing base for siding and shingles, in 4′ width, ½″ thickness, square edges. See table below for details.

function

Strength—Tests at the Forest Products Laboratory and the IIT Research Institute have proven the superior bracing and stiffening strength of both ½″ and 25/32″ USG Insulating Sheathing. Walls sheathed with 25/32″ insulating sheathing showed a rigidity factor of 3.0 compared to 1.0 for horizontal wood sheathing, exceeding structural requirements of FHA Tech. Circ. No. 12 for 4′ wide insulating sheathing used without diagonal bracing. In racking tests (table, right), all three types of USG Insulating Sheathing exceeded strength and deflection requirements of ASTM standard E-72. Tensile strength meets Federal Specification LLL-F-321b and Commercial Standard 42-49.

Insulation Value—A wood frame wall with wood siding and 25/32″ insulating sheathing reduces heat loss from 24% to 40% against the same assembly using wood sheathing. In insulation value, 25/32″ insulating sheathing is superior to 18″ of face brick, or 25″ of solid concrete. Its "R" Factor is rated at

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2.06, compared to 1.32 for ½″ insulating sheathing, 0.98 for nom. 1″ lumber, 0.45 for ½″ gypsum board, and 0.47 for ⅜″ plywood. See "k" values, below; also see "U" Factor Table, page 1.

Light Weight—USG Insulating Sheathing weighs from 800 to 1160 lbs. per M sq. ft. in ½″ thicknesses, depending on density, and approximately 1250 lbs. per M sq. ft. in 25/32″ thickness—both lighter than other comparable types of sheathing, hence easier to handle and install.

Economy—Low material cost, negligible waste; up to 1,200 sq. ft. of USG Insulating Sheathing can be erected per man per day. Because of its windtight joints, the use of building paper is unnecessary and not recommended.

limitations

1. During storage, inside or outside, care must be taken to keep the material dry. In outside storage the material must be protected with a suitable waterproof covering and should be elevated off the ground.

2. If the insulating sheathing becomes wet, it should be allowed to dry before application.

3. With 2′ x 8′ USG Insulating Sheathing, diagonal corner braces should be installed at all external corners.

* * *

Wood fiber ceiling panels are covered in USG Folder b-1506. Other USG insulation board products, available in areas of market demand, include **Roof Insulation,** 2′ x 4′ board size, in ½″ thickness increments up to 3″; **Insulating Roof Deck,** Regular and Vapor Seal types, 2′ x 8′ board size, 1½″ to 3″ thicknesses; and **Sound Deadening Board,** both wood fiber and mineral fiber types, 4′ x 4′ to 4′ x 12′ board sizes, ½″ thickness. For assemblies using USG Sound Deadening Board, see USG Folders a-1207, a-1297, a-1397.

USG Insulating Sheathing—Types and Sizes

type	size	nom. thickness	type edge	max. framing spacing	approx. wt. per M sq. ft. (lbs.)	insul. value	meets Federal Specs.
Regular	2′ x 8′	25/32″	T & G	24″	1250	.38(k)	LLL-1-535
	2′ x 8′	½″	"V"	16″	805		Class E
	4′ x 8′	25/32″	Sq.	24″	1250		
	4′ x 9′	25/32″	Sq.	24″	1250		
	4′ x 8′	½″	Sq.	16″	805		
	4′ x 9′	½″	Sq.	16″	805		
Intermediate (Corner Brace)	4′ x 8′	½″	Sq.	16″	1040	.40(k)	LLL-1-535
	4′ x 9′	½″	Sq.	16″	1040		Class E
*Nail Base (Super Strength)	4′ x 8′	½″	Sq.	16″	1160	.40(k)	LLL-1-535
	4′ x 9′	½″	Sq.	16″	1160		Class E

*Distribution limited to areas of market demand.

Racking Test Results—Insulating Sheathing

type of 4′ x 8′ sheathing (dry)	deflection (inches) at 1200-lb. load	2400-lb. load	4000-lb. load	max. load before failure (lbs.)
½″ Regular	0.15	0.47	1.23	4800
25/32″ Regular	0.15	0.36	0.99	6970
½″ Intermediate	0.10	0.25	0.60	6040
½″ Nail Base	0.10	0.23	0.49	7000

NOTE: Average of three racking tests on vertically applied panels, conducted at a nationally recognized testing laboratory.

specifications

FIRECODE* Sheathing

I. scope—Unless otherwise shown on plans, all exterior walls shall be sheathed according to these specifications.

II. materials

Sheathing shall be FIRECODE Sheathing, as manufactured by the UNITED STATES GYPSUM COMPANY, ½″ x 2′ x 8′ or ½″ x 4′ x 8′ or ½″ x 4′ x 9′.

Nails shall be 11-ga. galvanized, 7/16″ head diameter, 1½″ or 1¾″ long roofing nails.

Staples shall be 16-ga. galvanized divergent point, nominally ½″ wide, 1½″ long.

III. attachment

Nailing: when FIRECODE Sheathing, 2′ x 8′, is horizontally applied with diagonal bracing, or is supplementally nailed through direct application of exterior finish, nails shall be 8″ o.c. at each stud. Otherwise, horizontally applied 2′ x 8′ gypsum sheathing shall be nailed to each stud at 4″ o.c. spacing (7 nails per 2′ width, per stud). 4′ x 8′ or 4′ x 9′ sheathing shall be vertically applied, without diagonal bracing, and nailed 4″ o.c. around the entire perimeter of the board and 8″ o.c. on intermediate framing members.

Stapling: when FIRECODE Sheathing, 2′ x 8′, is horizontally applied with diagonal bracing, or is supplementally nailed through direct application of exterior finish, staples shall be spaced 8″ o.c. at each stud. Otherwise, horizontally applied 2′ x 8′ gypsum sheathing shall be stapled to each stud at 4″ o.c. spacing (7 staples per 2′ width, per stud). Staples shall be driven parallel to the long dimensions of the framing members. Staple heads shall be driven flush to sheathing surface and shall not break through sheathing paper. When FIRECODE Sheathing, 4′ x 8′ or 4′ x 9′ is to be installed, it shall be applied vertically, without diagonal bracing, and stapled at 4″ o.c. around perimeters of board and at 8″ o.c. on intermediate framing.

IV. optional inclusions

1. Wood Siding Over FIRECODE Sheathing—Apply siding directly over sheathing, securing it with nails driven through sheathing and into studs. Nails shall have a minimum penetration of 1¼″ into the studs. End joints of siding shall butt over center of studs.

2. Wood Shingles over FIRECODE Sheathing—Apply treated or decay-resistant ⅜″ x 1⅝″ lath strips to gypsum sheathing, and space according to shingle exposure. Nail lath to sheathing through studs with 8d nails penetrating lath. In double coursing method, rest butts of undercoursing on lath. Nail outer course to lath with small headed corrosion-resistant threaded nails penetrating lath. Project butts of outer course ½″ below lath.

3. Mineral Siding over FIRECODE Sheathing—(Various types of attachment systems are available for the application of mineral siding (asbestos shingles) over FIRECODE Sheathing.) Apply according to manufacturer's directions.

4. Masonry Veneer Over FIRECODE Sheathing—Provide clear space of 1″ min. between back of masonry and face of sheathing. Attach masonry ties with nails driven through the sheathing and into the studs, using nails of sufficient length to penetrate 1¼″ into the studs (at least 6d common nails). Space ties vertically to conform with coursing of masonry veneer.

5. Stucco Over FIRECODE Sheathing—Provide clear space of ¼″ min. between back of stucco lath and face of sheathing. Apply ORIENTAL* Exterior Stucco over sheathing by the use of USG 3.4-lb. self-furring Diamond Mesh Metal Lath applied with nails penetrating at least 1⅛″ into studs.

6. Corner Braces—When required, install 1″ x 4″ diagonal corner braces at all external corners, let into the face of studs, corner posts, sills and plates. Use two 8d nails at each bearing.

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specifications

USG Insulating Sheathing

I. scope—Unless otherwise shown on plans, all exterior walls shall be sheathed according to these specifications.

II. materials

Sheathing shall be USG Insulating Sheathing, as manufactured by the UNITED STATES GYPSUM COMPANY, ½″ or 25/32, Regular, Corner Brace or Super-Strength type.

Nails shall be galvanized, ⅜″ or 7/16″ head dia., 1½″, 1¾″ or 2″ long roofing nails (specify ring-barbed nails for Super-Strength Sheathing).

Staples shall be 14-ga. or 16-ga. galvanized divergent point, 7/16″ wide, 1⅛″ or 1½″ long.

III. attachment

2′ x 8′ USG Insulating Sheathing shall be applied with the long dimension across the supports and with the protruding edge up. Ends of sheets shall abut over centers of supports, and all end joints shall be staggered. Nails shall be spaced 4″ o.c. on edges of sheet and 8″ o.c. on intermediate studs. 14-ga. staples shall be spaced 4″ o.c. on edges of sheet and 8″ o.c. on intermediate studs. 16-ga. staples shall be spaced (3″ or 4″) o.c. on edges of sheet and at 6″ o.c. on intermediate studs.

4′ x 8′ and 4′ x 9′ USG Insulating Sheathing shall be applied with the long dimension parallel with the supports. Sides and ends shall abut the vertical framing members, top and bottom plates or headers. ⅛″ space shall be left between sheets. Sheathing shall fit snugly around all window and door openings. Nails shall be spaced (3″ or 4″) o.c. at edges of sheet and at (6″ or 8″) on intermediate studs. 16-ga. staples shall be spaced at (3″ or 4″) o.c. on edges of sheet and at 6″ o.c. on intermediate studs.

Each sheet shall be nailed to intermediate studs first. Nails and staples shall be not less than ⅜″ from edges or ends of sheathing. Exposed crown of staples shall be parallel to edges.

IV. optional inclusions

1. Wood Siding, Wood Shingles and Mineral Siding over USG Insulating Sheathing—Apply siding or shingles direct to USG Super-Strength (nail base) Sheathing with ring-barbed nails. (Various types of attachment systems are available for the application of mineral siding (asbestos shingles) over USG Regular or Corner-Brace Insulating Sheathing).

2. Masonry Veneer over USG Insulating Sheathing—Attach masonry ties with nails driven through sheathing into studs, with ties spaced 12″ o.c. Nails should be of sufficient length to penetrate 1¼″ into studs (at least 6d common nails). Space ties vertically to conform with coursing of masonry veneer.

3. Stucco over USG Insulating Sheathing—Apply USG 3.4-lb. Self-Furring Diamond Mesh Metal Lath over sheathing; nail securely into studding with 2″ large headed galvanized nails spaced 6″ o.c. vertically and 16″ o.c. horizontally. Apply stucco in normal manner.

4. USG Insulating Sheathing as Exterior Finish—When the sheathing is left exposed, the exterior surface should be painted with two coats of asphaltum base paint. Carefully treat joints around windows, doors, etc. with a waterproof caulking material. If sheathing is to be subjected to abuse from machinery, animals or other sources, it should be protected by adequate strips of lumber or other suitable finish.

5. Corner Braces—When required, install 1″ x 4″ diagonal corner braces at all external corners let into the face of studs, corner posts, sills and plates. Use 8d nails at each bearing.

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USG® Insulating Wool Products

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1907

A.I.A. File No. 37-C

description and utility

THERMAFIBER* Insulating Wool consists of spun mineral fibers mechanically formed either into a uniform mat of definite dimensions and controlled density or into a pellet form suitable for pouring or blowing into framing spaces. It is available in seven types of blankets for special uses, in two types of loose fill, and as semi-rigid perimeter insulation (see next page).

Compared to other types of insulation, THERMAFIBER is superior in resistance to heat transmission, in resilience that assures full thickness when installed, and in durability—never needs replacement or upkeep. It has greater density to aid staying in place, more uniformity in thickness. As with every product bearing the United States Gypsum name, it is quality controlled from start to finish. Other features:

Noncombustible—the mineral fibers will not burn or support combustion. Use of THERMAFIBER blankets increases fire ratings of certain partition assemblies (see USG Construction Selector index).

Vapor Resistance—three types of THERMAFIBER blankets have built-in vapor barriers to protect against condensation—of aluminum foil or strong asphalted paper with excellent vapor permeability factors of 0.30 and less than 1.00 perm respectively.

Highly effective in sidewalls when used with FIRECODE* Gypsum Sheathing and Insulating SHEETROCK* Wallboard or Insulating ROCKLATH* Plaster Base.

Non-deteriorating—the mineral fibers offer no sustenance to vermin; are resistant to decay and corrosion.

Moisture Resistance—mineral wool fibers do not absorb moisture. If wet, they dry quickly with adequate ventilation and recover their original insulating efficiency.

Rigidity, Strength—THERMAFIBER blankets have exceptional built-in rigidity, especially important for ceiling work. Batts have triple-thick, extra-wide flanges which make installation quicker and more secure.

Sound Control Value—in addition to providing thermal resistance, THERMAFIBER wool increases sound isolation properties and S.T.C. ratings when used in certain partition and floor assemblies (see USG Construction Selector index).

The use of insulating wool in attics and crawl spaces should be accompanied by adequate ventilation—to help reduce air conditioning costs and control moisture condensation. Ventilation is best accomplished under pitched roofs by use of the VENT-A-RIDGE/VENT-A-STRIP system; in crawl spaces by foundation vents. Ask your U.S.G. representative for Catalog RB-45 on Aluminum Louvers for details and requirements.

general limitations

1. Although the vapor barriers of THERMAFIBER blankets protect against the formation of condensation and reduce the danger of damage caused by condensation, over-humidification must be guarded against. If the relative humidity in the building is excessive, steps must be taken to reduce the sources of moisture.

2. The insulation value of assemblies is generally increased by recess application of wool blankets, thereby gaining an additional air space. Recommended minimum air space thicknesses are: in walls, ¾″; in ceilings and floors, 1″. With masonry walls, an air space of at least ¾″ should be provided between insulation and exterior wall. If THERMAFIBER Wool is placed in direct contact with exterior walls, the masonry must be watertight. Positive vapor barriers such as Insulating SHEETROCK or ROCKLATH or 2 mil polyethylene film should be applied to room side of furring members in order to reduce possibility of condensation on cold masonry walls.

3. Blankets placed between floor joists over unexcavated or basement areas should be supported on the underside by chicken wire or "Tiger Teeth" wire supports.

"installed resistance" standards

In accordance with industry standards, THERMAFIBER blankets and bags are now labeled with each product's "R" value—for *installed resistance*. This numerical guide more precisely reflects the total thermal performance of the insulation than did the former measure of thickness alone. All manufacturers' mineral wool insulation products marked with the same Installed Resistance Number now have the same insulation value regardless of individual thickness.

Architects thus are urged to specify simply the "R" numbers of insulation needed for each application. See comparison of "R" and "U" values, listed below, and "R" values for products shown on pages 2 and 3.

section to be insulated	U-value desired	THERMAFIBER "R" number needed to meet "U" shown
Ceilings	0.04‡ 0.05‡ 0.07 0.10	R-24‡ R-19‡ R-13 R-9
Walls	0.07‡ 0.09 0.11	R-11‡ R-8 R-7
Floors (over unheated space)	0.07‡ 0.09 0.11	R-13‡ R-9 R-7

‡These values meet the "All-Weather Comfort Standard" established for maximum thermal performance, recommended for electrically heated and air-conditioned buildings and other quality home installations.

A.I.A. File No. 37-C

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resistance values—THERMAFIBER Insulating Blankets

product & thickness	(R) mass insulation only 1/C	conduct-ance C	installed resistance (‡) (R) winter values for heating (heat loss)			installed resistance (‡) (R) summer values for air-conditioning (heat gain)		
			ceilings	floors	walls	ceilings	floors	walls
kraft-faced blankets 1½″	5.56	0.180	7 (2)	8 (2)	7 (1)	8 (2)	7 (2)	7 (1)
2″	7.41	0.135	9 (2)	9 (2)	8 (1)	9 (2)	9 (2)	8 (1)
3″	11.11	0.090	13 (2)	13 (2)	11 (3)	13 (2)	13 (2)	11 (3)
3⅝″	13.43	0.074	15 (2) 14 (3)	15 (2)	13 (3)	15 (2) 14 (3)	15 (2)	13 (3)
5″	18.52	0.054	19 (3) 20 (2)	21 (2)	—	19 (3) 20 (2)	20 (2)	—
6″	22.22	0.045	24 (2) 23 (3)	24 (2)	—	24 (2) 23 (3)	24 (2)	—
foil vapor barrier side 1½″	5.56		8 (2)	11 (2)	9 (1)	11 (2)	8 (2)	9 (1)
2″	7.41		10 (2)	13 (2)	11 (1)	13 (2)	10 (2)	11 (1)
2⅝″	9.72		13 (2)	15 (2)	13 (1)	15 (2)	13 (2)	13 (1)
3″	11.11		14 (2)	17 (2)	11 (3)	17 (2)	14 (2)	11 (3)
5″	18.52		21 (2)	24 (2)	—	24 (2)	21 (2)	—
6″	22.22		25 (2)	28 (2)	—	28 (2)	25 (2)	—
foil both sides 2″	7.41		11 (2)	16 (2)	11 (1)	16 (2)	11 (2)	11 (1)
3″	11.11		15 (2)	20 (2)	11 (3)	20 (2)	15 (2)	11 (3)

NOTE: All THERMAFIBER blankets are manufactured to possess conductance (k) of 0.27 and resistance (1/k) of 3.70 per in. thickness.
‡Installed Resistance is the sum of the mass resistance and the resistance of adjacent air spaces or air surfaces which may exist. (1) Install with ¾″ or larger air space between vapor barrier and wall surface. (2) Install with 1″ or larger air space between vapor barrier and floor or ceiling surface. (3) Installed with no air space.

types and functions

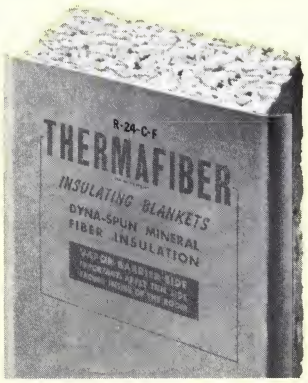
THERMAFIBER Regular Blankets are enclosed on one side with a strong asphalted paper vapor barrier which also forms nailing flanges. In the 1½″, 2″ and 3″ batts, the breather side is enclosed in fire-resistant, porous kraft paper—thus fully enclosed except for mill cut ends. Batts in the 3⅝″, 5″ and 6″ thicknesses, are supplied open-faced without breather paper. **Uses:** ceilings, floors, walls. Available in widths to accommodate common structural spacings. Federal Specs: 3⅝″ to 6″ blankets meet HH-I-521-C Type 1 Class B; 1½″ to 3″ blankets meet HH-I-521-C Type 1 Class C.

THERMAFIBER Reverse Flange Blankets are designed for application from the exterior or "cold" side of framing members. Fully enclosed in same manner as THERMAFIBER Regular Blankets, except that stapling flanges extend from breather side.

Uses: for floors over unheated crawl spaces, recessed between joists; also in walls and ceilings accessible from outside. Available in 2″ and 3″ thickness, 15″ width. Federal Specs: meet HH-I-521 Type 1 Class C.

THERMAFIBER Silver Shield Blankets are enclosed in highly polished aluminum foil, except for mill cut ends, to reflect up to 95% of radiant heat striking them. Back surface is perforated to allow breathing of mineral wool fibers and minimize vapor traps; foil on vapor barrier side is not perforated. Kraft paper sides separate front and back foil panels to prevent heat transfer. Two types—aluminum foil on both sides, or on vapor barrier side only. **Uses:** ceilings, walls, floors with air space as noted in chart—most effective with air conditioning and in areas of extreme summer temperatures. Available in 1½″, 2″, 2⅝″, 3″, 5″ and 6″ thickness, 15″ and 23″ width. Federal Specs: meet HH-I-521-C Type 1 Class C.

THERMAFIBER Flame-Resistant Insulating Blankets are open-faced, foil-covered on vapor barrier side, with stapling flanges. Fire hazard classification: flame spread 25, fuel contributed 2, smoke developed 28. Available in 2″, 2⅝″ and 3″ thickness, 15″ and 23″ width, 48″ length.



THERMAFIBER
Regular Blanket

THERMAFIBER
Reverse Flange Blanket

THERMAFIBER
Silver Shield Blanket

THERMAFIBER
Fast-Fit Blanket

THERMAFIBER Fast-Fit Blankets meet the need where quick application is the most important factor. They have no flanges, thus eliminate need for staple fastening: are made slightly wider than normal to give snug friction fit between studs; open-faced on breather side. **Uses:** for sidewalls only. Fast-Fit Blankets require a separate vapor barrier, such as Insulating SHEETROCK* Wallboard or Insulating ROCKLATH* or IMPERIAL* Plaster Bases, or a 2 mil polyethylene film. Available in 2″, 3″ and 3⅝″ thickness, 15″ width. Federal Specs: meet HH-I-521-C Type 1 Class B.

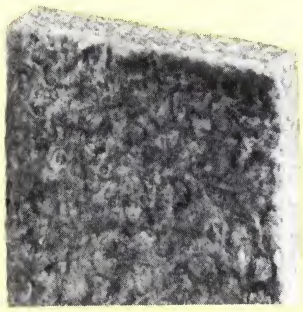
THERMAFIBER M-S Blankets are specially designed for insulating *exterior* furring and curtain wall assemblies which utilize metal studs. They are flangeless, open-faced on breather side, made like Fast-Fit Blankets for friction fit and require same types of separate vapor barrier. Available in 2″, 3″ and 3⅝″ thickness, 16″ and 24″ width, 48″ and 96″ length. Federal Specs: meet HH-I-521-C Type 1 Class B.

THERMAFIBER Sound Attenuation Blankets are a paperless, semi-rigid spun mineral fiber mat which substantially improves STC ratings when used in stud cavities of various USG partition assemblies (see Construction Selector). Available in 1″, 1½″ and 2″ thickness, 16″ and 24″ width, 48″ length. Fire hazard classification: flame spread 25, fuel contributed 20, smoke developed 0. Federal Specs: meet HH-I-521-C Type 1 Class A.

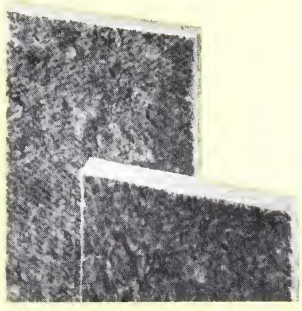
THERMAFIBER Blowing Wool consists of mineral fibers formed into pellets for installation by pneumatic machine. **Uses:** in attics or floors directly over ceiling; in wall spaces of existing buildings. Federal Specs: meet HH-I-521-C Type 3. Applied thicknesses and coverages to provide Installed Resistance "R" values for ceilings as shown:

(R) value (1)	R-30	R-24	R-19	R-13	R-11	R-7
min. thickness	8¾″	7″	5½″	3¾″	3⅛″	2″
max. coverage sq. ft./30-lb. bag	21	27	35	53 (2)	64	100
weight installed psf	1.49	1.17	.92	.62 (2)	.52	.33

(1) Includes 0.6 Resistance units value of top air surface of wood. Based on "k" value of 0.30 achieved with wool density of 2 lbs. per cu. ft. (2) R-12 value when used to fill 3⅝″ thick cavity of frame wall; coverage reduced and density increased due to compacting of wool fibers. 1/k: 3.33.



THERMAFIBER
Sound Attenuation Blanket



USG Perimeter
Insulation

THERMAFIBER Handy Fill is similar to Blowing Wool except made with slightly larger nodules for pouring and spreading by hand. **Uses:** in attics or floors accessible from above, installed directly into joist cavity. Federal Specs: meet HH-I-521-C Type 3. Applied thicknesses and coverages to provide "R" values shown:

(R) value (1)	R-24	R-21	R-19	R-13	R-11	R-7
min. thickness	7″	6″	5½″	3⅝″	3″	2″
max. coverage sq. ft./18-lb. bag	12½	15	16	25	30	45

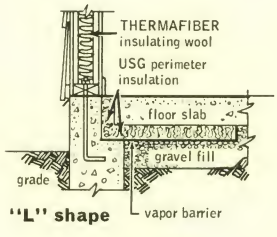
(1) Resistance of mass insulation plus 0.6 resistance units for value of exposed surface air film. Based on "k" value of 0.30. 1/k: 3.33.

USG Perimeter Insulation is a semi-rigid mineral wool board designed to reduce heat loss along foundation perimeters in slab and crawl space construction. Made of non-capillary inorganic fibers bonded with phenolic resin, it will not wick moisture from damp areas; is non-combustible and permanent, requires no maintenance. Density of 8 lbs. per cu. ft., compression of not more than 10%; has sufficient resilience to act as an expansion joint filler between floor slab and foundation wall.

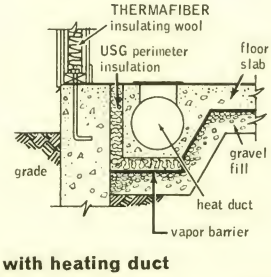
Uses: provides high thermal resistance in L-shaped application with floor slabs, with crawl spaces used as heating plenums, and in insulating heating ducts in slabs (see details); should not be used below the normal water table. Available as follows:

thickness (in.)	width (in.)	length (in.)	approx. weight psf.	conductance C	resistance 1/C
1½	12,18,24	48,60	1.01	0.16	6.25
1	12,18,24	48,60	0.67	0.24	4.17
¾	12,18,24	48,60	0.50	0.32	3.13

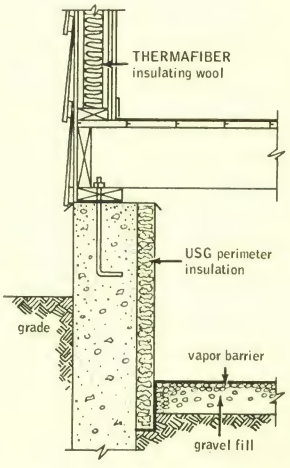
Federal Specs: USG Perimeter Insulation meets HH-I-562 Type 1 Class 2 (as amended). Conductivity "k" factor: 0.24; resistivity 1/k factor: 4.17.



"L" shape



with heating duct



crawl space

specifications

THERMAFIBER Insulating Wool

materials

Insulation in (designate building sections) shall be THERMAFIBER (specify "R" number, thickness and product type from pages 2 and 3), installed in accordance with manufacturer's directions.

application

1. Insulating wool blankets. Blankets shall be installed between framing members (1) leaving minimum air space between wool and interior (wall) (ceiling) surface or (2) face stapled to framing members. All spaces shall be insulated, including areas between floor joints and outside header, leaving no voids. Wool shall be installed behind electric outlets, around structural obstructions, jambs, sills, etc., and such areas, as well as plates and headers, shall be covered with vapor barrier paper.

2. Sound attenuation blankets. Blankets shall be pressed firmly in place against back of (wallboard) (plaster) base layer, and stapled as directed by manufacturer. An air space shall be maintained between blankets and back surface of one partition face. Ends of blankets shall be tightly butted, leaving no voids.

3. Blowing wool. Wool shall be applied by pneumatic blowing machine; blown according to manufacturer's directions, to a thickness of ( ) to provide Installed Resistance of ( ) and installed weight of ( ) per sq. ft. Application shall be to uniform depth and proper density, with care taken that soffit vents remain open.

USG Perimeter Insulation

materials

Perimeter edge of concrete floor slab (or designate building section) shall be insulated with USG Perimeter Insulation (designate thickness and size) installed in accordance with manufacturer's specifications.

application

1. Vertical application—inside of foundation. With all exterior masonry and poured concrete walls, USG Perimeter Insulation shall be installed against the inside face of the foundation prior to backfilling and before any base layer of gravel, stone or the concrete slab itself has been put in place. Permanent attachment is not required. Insulation may be held firmly in place by temporary bracing or the pressure of backfill. Edges of board shall be butted together. Care shall be taken so as not to damage insulation when backfill is put in place.

2. Vertical application—exterior of foundation. For exterior application trench shall be dug around exterior 12″ or more below grade. Exposed surface of foundation shall be cleaned of dirt and painted with asphalt foundation primer. USG Perimeter Insulation shall be cemented to the surface of the foundation with mastic asphalt cement, with edges of board butted together. Metal flashing shall be installed above insulation to shield from elements. Asbestos cement board or Portland cement stucco shall be applied over the outside exposed surface of the insulation.

3. Horizontal application. Where horizontal insulation is specified, USG Perimeter Insulation shall be installed after gravel fill has been built up to grade and thoroughly tamped. Insulation shall be laid in place with edges pressed together and butting foundation wall or vertical insulation applied adjacent to it.

4. When called for on the drawings, a vapor barrier of 55# asphalt roll roofing shall be laid over the underbed.

5. All work shall be done in a neat and workmanlike manner.

U.S.G. SALES OFFICES: **ALABAMA:** Birmingham, 871-6136 • **ARIZONA:** Phoenix, 274-5461 • **CALIFORNIA:** Fresno, 233-1102; Los Angeles, 338-1171; Los Angeles (So. Calif.), 665-5721; San Leandro, 569-3020; Sacramento, 443-1989; San Diego, 295-5191 • **COLORADO:** Denver, 388-6301 • **CONNECTICUT:** Hamden, 288-1607 • **FLORIDA:** Jacksonville, 359-1628; North Miami, 754-4553 • **GEORGIA:** Atlanta, 231-3180 • **ILLINOIS:** Chicago, 321-5861; Peoria, 682-5478 • **INDIANA:** Indianapolis, LI 6-4775 • **KENTUCKY:** Louisville, 895-9478 • **LOUISIANA:** New Orleans, 822-0482 • **MARYLAND:** Baltimore, DR 7-8001 • **MASSACHUSETTS:** Cambridge, 491-6318 • **MICHIGAN:** Southfield, 357-2000; Grand Rapids, 456-8611 • **MINNESOTA:** Minneapolis, WA 7-9911 • **MISSOURI:** Kansas City, WE 1-1388; Clayton, PA 1-1133 • **NEBRASKA:** Omaha, 551-6166 • **NEW JERSEY:** Clifton, 472-3900 • **NEW MEXICO:** Albuquerque, 268-2457 • **NEW YORK:** Albany, IV 9-2559; Buffalo, 854-3427; De Witt, 446-1291; Hempstead, 485-9233; New York, 935-4460 • **NORTH CAROLINA:** Charlotte, 332-5023; Raleigh, 828-5441 • **OHIO:** Cincinnati, 961-4300; Cleveland Heights, 321-4141; Columbus, 486-5981 • **OKLAHOMA:** Oklahoma City, JA 5-6645 • **OREGON:** Portland, 227-2518 • **PENNSYLVANIA:** Harrisburg, 234-3251; Bryn Mawr, LA 5-7630; Pittsburgh, 561-4600 • **TENNESSEE:** Memphis, 324-3796; Nashville, 254-1928 • **TEXAS:** Dallas, FL 1-5386; Houston, JA 4-7448; San Antonio, TA 4-4534 • **UTAH:** Salt Lake City, 359-3751 • **VIRGINIA:** Arlington, 525-3301; Richmond, 359-4008 • **WASHINGTON:** Seattle, 633-0745; Spokane, MA 4-3311 • **WISCONSIN:** Milwaukee, BR 6-5672.

USG® Paint Products

f

1917

A.I.A. File No. 25-B

description and utility

The complete and modern product line offered by United States Gypsum in paints and surface treatment is a natural outgrowth of the company's experience. As the world's largest producer of gypsum and other wall and ceiling construction materials, U.S.G. should know best how to *finish* those surfaces.

Today's full range of USG interior, exterior and special coatings reflects decades of research and testing, both in the laboratory and the marketplace. U.S.G. has the broadest job experience in the industry; 45% of all American homes are built or finished with its various products. Finishing products undergo daily analysis and improvement at the same Research Center (illustrated) where structural materials are developed—to meet standards of quality without compromise.

Use of USG paints brings the important advantage of dealing with a single manufacturer who is responsible for all components of the finished wall or ceiling—lath and plaster or gypsum wallboard and joint treatment, drywall screws and adhesives, metal studs and accessories, insulation, sheathing, ceiling tile, gypsum roof deck, asphalt roofing and stucco or asbestos siding. All are made by U.S.G. to *work together*.

This catalog covers the finishing products recommended for virtually all U.S.G. partition and ceiling assemblies, as well as for exteriors. A complete, quick-reference Selector Guide appears on pages 4 and 5; general specifications start on page 6. Drywall joint treatment products are covered separately in folder f-1887.

USG paint products are available in six special-purpose groups:

Interior Finishes—emulsion line headed by GRAND PRIZE* Latex Wall Paint and matching latex and solvent-thinned enamels; also TEXOLITE* Alkyd Latex Paint and matching latex semi-gloss enamel. In addition, a complete range of spirit-thinned finishes including USG and PRO-KYD* alkyd flat wall paints, DIAMOND Lustre and Eggshell enamels.

Exterior and Masonry Coatings—from a recent breakthrough in USG research, general purpose breather-type house paints perform superbly over wood siding and shingles as well as masonry surfaces. A full color range is available in solvent finishes, headed by IMPERIAL* Gloss House Paint and Trim Colors, plus USG Low Lustre House Paint and USG Porch and Floor Enamel; also in latex type exterior finishes such as tough USG Latex House Paint and low-sheen USG Vinyl Exterior Paint. Masonry coatings include CEMENTICO* hydraulic cement paint, DURA-DRI* moisture control coating, and USG Latex Floor Paint.

Wood Stains and Varnishes—pigmented USG Wood Stains, available in 8 colors, are outstanding in uniformity of final finish. Varnish products, all of superior durability, include USG Polyurethane Clear Finish, USG Satin Finish, and USG Floor and Trim Varnish.

Texture Finishes—the industry's broadest line, leading the resurgence of interior ornamentation, includes ready-to-use USG Texture I sand-finish and Texture II ripple-finish; USG Texture and TEXTONE* in powder form: IMPERIAL QT Texture Finish for an acoustical appearance on ceilings; USG Spray Texture and A-B TEX* for special effects.

Surface Preparation Products—long-established leadership items are SHEETROCK* Sealer and pigmented TEXOLITE Primer-Sealer; line includes latex and alkyd interior primers, enamel undercoat, oil-based exterior primers, penetrating sealer and block filler.

Special Coatings—an advanced USG development, fast rising in architectural uses, is the Epoxy Coatings System providing sanitary ceramic-like protection for walls. Also excelling in maintenance value is METAL COAT Enamel, available in a select color line, plus three companion primers to retard and prevent rust.

*Reg. U.S. Pat. Off.

general limitations

The most common causes of paint failures on interior surfaces are: (a) Base surface not dry; (b) Surface improperly cleaned and patched; (c) Variable suction in the base; (d) Failure to use proper treatment for different surfaces, conditions, and finishes. It is estimated that 75% of interior paint failures are due to neglected or improper preparation before the paint can was opened.

Satisfactory results with USG paint products, as with all finishes, depend upon good job practices:

1. Surfaces to be painted must be clean, dry, sound; free of grease, oil, wax, other foreign matter; free of flaking, crumbling or chalking conditions; must be properly prepared.

2. Atmospheric and structural temperatures must be 50° to 60° minimum during application, depending upon type of finish; consult directions.

3. Paints of the water-thinned type should not be used over wallpaper having water-soluble colors; must be protected from freezing.

4. New unpainted plaster, stucco, poured concrete, patches in masonry surfaces must age 30 to 60 days minimum prior to paint application; consult directions.

Any other limitations are stated in the label directions for each product.

types and functions

1. Interior Wall and Ceiling Paints

GRAND PRIZE Latex Wall Paint —vinyl plastic flat paint for smooth velvet finish, ready to use. Resists alkalinity in plaster, concrete and joint treatment. Exceptional hide, low sheen and extreme washability. The top-quality latex flat in U.S.G. line, covers most surfaces in one coat. Quick-drying, with excellent leveling qualities. Styrene-butadiene latex vehicle. 20 ready-mixed colors, matched in two enamels below.

GRAND PRIZE Latex Semi-Gloss Enamel—premier medium-gloss enamel, water-thinnable,

A.I.A. File No. 25-B

matching all ready-mixed colors of GRAND PRIZE wall paint. For all interior surfaces where semi-gloss finish is desired. Quick-drying, but good leveling. Superior hide, gives uniform sheen in 50° range; highly washable and stain-resistant. Self-priming on new drywall surfaces. Acrylic copolymer emulsion modified with alkyd resin.

USG Satin-Lustre Enamel—spirit-thinned alkyd semi-gloss offered as companion product matching all ready-mixed colors of GRAND PRIZE wall paint. For wood trim and wall surfaces of kitchen, bath, laundry; sealer or undercoater required on new work and porous surfaces. Dries to medium sheen with outstanding washability, excellent color retention. Alkyd oil resin vehicle.

TEXOLITE*Alkyd Latex Wall Paint—ready-to-use flat finish, offers good quality with economy, combines easy-flowing application of latex paints with flatness of alkyds. Good one-coat hide can usually be achieved; provides a washable film. Uses water for thinning and clean-up. Alkyd modified styrene-butadiene latex vehicle. 14 colors, matched in **USG Latex Semi-Gloss Enamel** and oil-based **USG Semi-Gloss Enamel.** Also available: ADD-A-FLECK special liquid additives containing gold metal flake or colored enamel fleck to produce sparkling multi-color appearance; added to any color of TAL paint; for spray application only.

USG Alkyd Flat Enamel—outstanding spirit-thinned finish for interior walls and woodwork. Excellent hide and leveling, readily washable. Self-priming except over patched, porous or unpainted surfaces. Soya alkyd resin vehicle. Available in white only, plus machine tint bases.

DIAMOND Lustre and Eggshell Enamels—high gloss and low-lustre finishes of extreme durability to meet the most stringent maintenance demands. Spirit-thinned; provide flexible film with exceptionally high hide. Soya alkyd resin vehicle. White only; may be tinted.

*USG Machine Color System: more than 1000 appealing custom colors are available on special order through dealers using USG Paint Colorants. This range offered in nine products—*GRAND PRIZE *and* VELVO-TINT *Latex Wall Paints, oil-based USG Alkyd Flat Enamel,* GRAND PRIZE *Latex Semi-Gloss Enamel, alkyd oil-based USG Satin-Lustre and* DIAMOND *Lustre Enamels, oil-based* IMPERIAL *Gloss House Paint and Trim Colors, USG Latex House Paint, and USG Latex Floor Paint. Ask your USG representative for a reference copy of the MA-644 Architect Color Styler binder, containing chips and samples of 280 chromatically selected colors.*

2. Exterior and Masonry Coatings

IMPERIAL Gloss House Paint—USG's finest exterior gloss finish, with a balanced oil-based formula for long weather resistance. Heavy bodied, with superior hiding and controlled chalking qualities. Tough, flexible film resists cracking and checking, offers maximum protection for substrates. Excellent adhesion, mildew and fume resistance. One coat is sufficient on most surfaces when used over IMPERIAL House Primer. Linseed oil vehicle. 7 ready-mixed colors, plus white and 6 darker shades in IMPERIAL **Trim Colors.**

USG Low-Lustre House Paint—solvent-thinned, quality low-sheen exterior finish offers superior hiding in one coat over primed surfaces—wood shingles and shakes, all types of siding. Self-priming when used over most previously painted surfaces. Linseed alkyd resin vehicle. Available in 11 ready-mixed colors which may be intermixed.

USG Latex House Paint—breather-type modified acrylic emulsion with major advantages over other types: quick-

drying, non-yellowing, longer-lasting, mildew-resistant, good bond, pleasing medium lustre. Has excellent hide, controlled chalking. Resistant to alkali, does not readily blister, fade, or stain. Principally for wood siding and shingles, but also performs well over masonry, stucco, weathered asbestos cement. Modified acrylic latex emulsion vehicle. 13 colors.

USG Vinyl Exterior Paint—an economical non-penetrating coating for unglazed masonry, stucco, wood shakes and primed siding. Combines good hiding, weather resistance, truer non-fading color, quick drying. Breather-type formulation permits unwanted moisture to escape. Two coats produce best results. Emulsified polyvinyl acetate vehicle. 15 colors.

USG Porch & Floor Enamel—polyurethane modification provides tough, hard-wearing gloss finish for wood and concrete floors, walls and dados in recreation and laundry rooms, corridors, etc. Resists heavy moisture, heat, stains, grease. Quick-drying, water-repellent, alkali-resistant. Spirit thinned; tolulene diisocyante soya alkyd copolymer vehicle. 5 ready-mixed colors.

USG Latex Floor Paint—a tough, medium sheen finish for interior or exterior floors of previously painted or primed concrete or wood. Fortified with epoxy resins for wear resistance. Alkaline-resistant, quick-drying, normally bonds without etching, but firm, non-dusty surface is mandatory. White and five dark colors, also in tint bases.

CEMENTICO* Masonry Coating—a water-repellent hydraulic cement base paint in powder form, to be mixed with water. For interior and exterior porous masonry surfaces. Excels in hardness, durability, binding qualities, and workability. Two coats recommended; sand may be added for coating to be scrubbed into masonry to make smoother, denser surface. The 10 colors are light-fast, lime-proof, alkali-resistant.

DURA-DRI* Coating—a heavy-bodied aggregated powder, mixed with water, to decorate and protect against mild water penetration through masonry. Applied in two coats alone or over DURA-STOP* Compound (see Surface Preparation Products). Four colors; may be overcoated with CEMENTICO for greater color range. Special DURA-DRI Latex Additive should be specified to improve adhesion, harden surface.

3. Wood Stains and Varnishes

USG Wood Stains—pigmented stains with controlled penetration to bring out the natural beauty of wood paneling, furniture, etc. Alkyd solids content permits partial seal of surface, more uniformity of final finish. Non-bleeding, non-

*Reg. U.S. Pat. Off.

fading, minimum grain raise. Versatile in application—may be sprayed, dry brushed, wiped, or used full strength. Available in 7 popular stains for interior use, plus Redwood for interior or exterior; stains may be intermixed for special requirements. Linseed-phenolic resin vehicle.

USG Polyurethane Clear Finish—an interior-exterior gloss varnish to meet the highest durability requirements in fine floors, woodwork, exterior doors, boat decks, etc. Gives clear transparent finish, waterproof; easier handling because it is a one-component system. Special vehicle compound of soya oil modified polyurethane provides good adhesion when recoated.

USG Satin Finish and **Floor & Trim Varnishes**—offer choice of flat or gloss finish, long-wearing and resistant to water and check cracking. Both types are water-white clear and do not alter or discolor the surface appearance. For use on floors, woodwork, doors, furniture. Good body and flow qualities. Linseed soya alkyd vehicle. Should be primed with **USG Sanding Sealer,** which provides ½ fill on open-grain wood to allow one-coat finish results.

4. Interior Texture Finishes

USG Texture I—a ready-to-use latex emulsion paint embodying a fine aggregate to produce a slight sand-finish effect combined with light texture. One coat covers fine cracks, blemishes. Quick-drying, 7 ready-mixed colors.

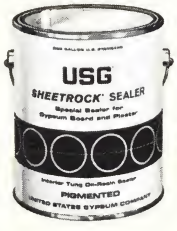
USG Texture II—flat ripple finish in a latex emulsion. Contains no sharp aggregate, can produce fine textures ranging from "orange peel" effect to smooth rounded stipple. Conceals moderate imperfections, normally requires no sealer. Quick-drying, washable, recoatable. 7 ready-mixed colors.

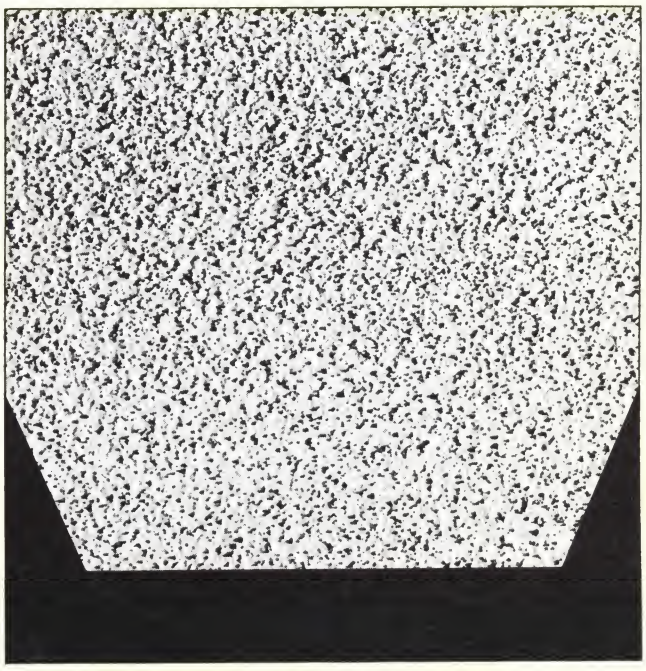
Other paste textures available: **USG Texture VII,** sanded latex drywall surfacer; **USG Texture VIII,** drywall spray surfacer; **USG Texture IX,** heavy-bodied latex; **USG Texture XI,** latex paste stipple; **USG Sanded Paste Stipple,** alkyd resin compound.

IMPERIAL QT Texture Finish—aggregated powder, produces acoustical finish appearance on ceilings; provides no acoustical correction. Excellent bonding qualities; helps conceal surface defects. Spray-applied in coarse, medium or fine texture. White only. First coat of PRO-KYD Alkyd Flat Wall Paint recommended.

TEXTONE*—the king of textures, especially adapted to heavy stipples, deep textures and a wide range of design applications. For hand application; insoluble and durable. Useful for refinishing plaster surfaces, producing stone or antique effects, stencil work; unequalled for concealing wall blemishes. White only, but can be tinted with TEXOLITE* Standard or coated with most wall paints.

Other powder textures include **USG Texture Paint,** for medium heavy to medium light stipples; **A-B TEX* Texture Paint,** for light stipples and orange-peel textures; **USG Texture XII,** spray-applied sand finish for drywall.





Ceiling spray-finished with IMPERIAL QT Texture

Texture Designs: dramatic new concepts in wall texture, with directions for accomplishing various effects with the products above, are presented in a 24-page brochure, "A Time for Texture". Your U.S.G. representative can supply a copy—No. T-641.

5. Surface Preparation Products

TEXOLITE Primer-Sealer—a pigmented latex product for use under any type of paint or enamel, performs better under water-thinned paints than any other sealer. Locks in lime, equalizes suction, lays paper and fiber nap, provides "tooth". White only, but may be tinted.

SHEETROCK* Sealer—a tung oil resin emulsion sealer for use over gypsum wallboard; also unsurpassed in bridging and filling hairline cracks in plaster. May be used under all interior paints and wallpaper. Equalizes porosity over joint reinforcement and face paper. Especially recommended for kitchens and bathrooms. Should be tinted to shade of finish coat.

USG Alkyd Wall Primer-Sealer—premier quality solvent-thinned sealer of controlled penetration type. For interior use under oil-base or water-thinned paints or enamels. White only; may be tinted. Soya alkyd resin vehicle.

USG Alkyd Enamel Undercoat—alkyd base mineral spirit undercoat for interior gloss, semi-gloss or flat oil paints. Not a sealer, but provides low-cost good first coat; fills and equalizes surface to be painted. May be tinted.

USG Penetrating Sealer—a special non-pigmented alkyd resin solution in spirits, designed to condition exterior or interior surfaces which are porous or moderately chalky; forms firm tight base for repainting with any paint except cement bonding type. May be tinted.

IMPERIAL House Primer—for exterior use under white or colors of IMPERIAL Gloss House Paint; specially formulated to control penetration of oils into surface. Excellent bonding, elastic film, moisture resistant. White only, may be tinted.

continued on page 6

*Reg. U.S. Pat. Off.

SELECTOR GUIDE TO USG PAINT PRODUCTS

construction materials	type of finish desired	special surface treatment: new work	special surface treatment: redecorating	finish product description	thinners	method application	hours drying time: touch	hours drying time: recoat	one gal. coverage (sq. ft.)
INTERIOR WALLS									
Block, Brick, or Concrete	Velvet, Smooth Surface	USG Block Filler	USG Block Filler (opt.)	GRAND PRIZE Latex Wall Paint	NR/w	B1, R1, S1	½	8	450
	Velvet, Natural Texture	TEXOLITE Primer-Sealer	None	GRAND PRIZE Latex Wall Paint	NR/w	B1, R1, S1	½	8	450
	Flat, Smooth Surface	USG Block Filler	USG Block Filler (opt.)	TEXOLITE Alkyd Latex	NR/w	R1, S1, B2	½	8	400
	Flat, Natural Texture	TEXOLITE Primer-Sealer	None	TEXOLITE Alkyd Latex	NR/w	R1, S1, B2	½	8	400
	Semi-Gloss, Smooth Surface	USG Block Filler	TEXOLITE Primer-Sealer	USG Satin-Lustre Enamel	NR/ms	S1, B2, R2	3	24	450-500
	Semi-Gloss, Natural Texture	USG Alkyd Enamel Undercoat	USG Alkyd Enamel Undercoat	USG Satin-Lustre Enamel	NR/ms	S1, B2, R2	3	24	450-500
	Gloss, Smooth Surface	USG Block Filler	USG Alkyd Enamel Undercoat	DIAMOND Lustre Enamel	NR/ms	S1, B2, R2	3	24	450
	Gloss, Natural Texture	USG Alkyd Enamel Undercoat	USG Alkyd Enamel Undercoat	DIAMOND Lustre Enamel	NR/ms	B1, R1, S1	3	24	450
	Epoxy Glaze, Smooth	ACREPOX Block Filler	ACREPOX Block Filler	ACREPOX Finish	SS/USG	B1, R1, S1	4	8	190-220
	Cement, Smooth	Pre-wet	Clean, pre-wet	CEMENTICO Coating	W	B1, S2	—	24	16-24 (lb.)
	Cement, Sanded	Pre-wet	Clean, pre-wet	DURA-DRI Coating	W	B	—	24	16-24 (lb.)
Plaster	Velvet	TEXOLITE Primer-Sealer	None	GRAND PRIZE Latex Wall Paint	NR/w	B1, R1, S1	½	24	450
	Flat	TEXOLITE Primer-Sealer	None	PRO-KYD Alkyd Flat	NR/ms	R1, S1, B1	1	24	400
	Flat	TEXOLITE Primer-Sealer	None	USG Alkyd Flat Enamel	NR/ms	B1, R1, S1	1	24	400
	Semi-Gloss	USG Alkyd Primer-Sealer	USG Alkyd Enamel Undercoat	USG Satin-Lustre Enamel	NR/ms	S1, B2, R2	3	24	450-500
	Gloss	USG Alkyd Primer-Sealer	USG Alkyd Enamel Undercoat	DIAMOND Lustre Enamel	NR/ms	S1, B2, R2	3	24	450
	Epoxy Glaze	USG Penetrating Sealer	ACREPOX Finish	ACREPOX Finish	SS/USG	S1, B2, R2	4	8	190-220
Gypsum Wallboard	Velvet	TEXOLITE Primer-Sealer	GRAND PRIZE Paint	GRAND PRIZE Paint	NR/w	B1, R1, S1	½	24	450
	Flat	SHEETROCK Sealer	None—prime if needed	PRO-KYD Alkyd Flat	NR/ms	R1, S1, B1	3	24	400
	Semi-Gloss	GRAND-PRIZE Latex Semi-Gloss Enamel	Self-priming	GRAND PRIZE Latex Semi-Gloss Enamel	NR/w	S1, B1, R1	½	24	450
	Gloss	USG Alkyd Wall Primer-Sealer	USG Alkyd Enamel Undercoat	DIAMOND Lustre Enamel	NR/ms	S1, B1, R2	3	24	450
	Epoxy Glaze	ACREPOX Finish	ACREPOX Finish	ACREPOX Finish	SS/USG	S1, B2, R2	4	24	190-220
	Sand Float Texture	None	None	USG Texture I	NR/w	B1, R1	½	24	200
	Orange-peel to Ripple Texture	None	None	USG Texture II	NR/w	B1, R1, S1	1	24	200
	Heavy Stipple or Period Texture	As required	As required	TEXTONE; then GRAND PRIZE Paint	W	B, R, O	1	12	9-36 (lb.)
	Medium Light to Medium Heavy Texture	Usually none	None	USG Texture Paint; then GRAND PRIZE Paint (also 2 finishes below)	W	B, R, O	1	12	27-54 (lb.)
	Medium Light to Very Light Text.	Usually none	None	A-B TEX or USG Spray Texture	W	B, R, S, O	1	12	27-54 (lb.)
	Sand Finish	None	None	USG Texture VII or USG Drywall Surfacer	W	S	1	12	20-35 (lb.)
Wood	Semi-Gloss	USG Alkyd Enamel Undercoat	USG Alkyd Enamel Undercoat	USG Satin-Lustre Enamel	NR/ms	S1, B1, R2	3	24	450-500
	Gloss	USG Alkyd Enamel Undercoat	USG Alkyd Enamel Undercoat	DIAMOND Lustre Enamel	NR/ms	S1, B1, R1	3	24	450
	Flat	USG Alkyd Primer-Sealer	None—dull gloss	PRO-KYD Alkyd Flat	NR/ms	R1, S1, B1	1	24	400
	Gloss or Satin Finish Clear	USG Sanding Sealer	USG Sanding Sealer	USG Satin Finish Varnish or USG Polyurethane Clear Finish	NR	B only	2	12	500
Metal (Ferrous)	Flat (Water Thinned)	METAL COAT Iron Oxide Primer	None, if free of rust	GRAND PRIZE Latex Wall Paint	NR/w	B1, S1, R2	½	8	450
	Gloss (Solvent Thinned)	METAL COAT Iron Oxide Primer	None, if free of rust	METAL COAT Enamel	NR/ms	B1, S1, R2	2	24	600
Metal (Bright)	Aluminum	METAL COAT Zinc Chromate Primer	None, if free of rust	USG Aluminum Coating	NR/ms	B1, S1	2	24	600
Metal (Galvanized)	Gloss	METAL COAT Zinc Dust Primer	None, if free of rust	METAL COAT Enamel	NR/ms	B1, S1, R2	2	24	600

SELECTOR GUIDE TO USG PAINT PRODUCTS

construction materials	type of finish desired	special surface treatment: new work	special surface treatment: redecorating	finish product description	thinners	method application	hours drying time: touch	hours drying time: recoat	one gal. coverage (sq. ft.)
INTERIOR CEILINGS									
Acoustical Tile or Plaster	Flat (Low Scrub)	None	None	TEXOLITE Standard Paint	NR/w	R1, S1	½	8	350
Gypsum Board	Flat (Med. Scrub)	None, or TEXOLITE Primer-Sealer	None	USG Super Ceiling White	NR/w	B1, R1, S2	½	8	250
	Flat (High Scrub)	TEXOLITE Primer-Sealer	GRAND PRIZE Latex Wall Paint	GRAND PRIZE Latex Ceiling White Paint	NR/w	B1, R1, S1	½	8	450
	Textured	USG Texture I, II, VII, or XII	USG Texture I, II, VII, or XII	Any of above finishes for wallboard	see above	see above	see above	see above	see above
Plaster	Flat	USG Alkyd Primer-Sealer	USG Alkyd Primer-Sealer	PRO-KYD Alkyd Flat	NR/ms	B1, R1, S1	1	24	400
	Flat	TEXOLITE Primer-Sealer	None, or TEXOLITE Primer-Sealer	Any USG latex paint shown for int. walls	—	—	—	—	—
Plaster, Drywall, or Poured Concrete	Rough Texture	None (smooth where required)	None (smooth where required)	IMPERIAL QT Texture Finish	W	S only	24	not rec.	—
Poured Concrete	Smoothed and Leveled	None	None	A-B TEX Paint	W	T1	1	12	variable
FLOORS & PATIOS **Firm Poured Concrete, Brick, Asph., Dusting Cement**	Medium Sheen	None, if clean, non-dusting; or USG Penetrating Sealer	None; clean, firm	USG Latex Floor Paint	NR/w	B1, R1	½	24	350
Wood or Concrete	High Sheen	USG Penetrating Sealer; or self-prime	None; clean, firm	USG Porch & Floor Enamel	NR/ms	B1, R1	4	12	400
EXTERIOR SURFACES									
New—Block, Brick, Stucco or Poured Concrete	Low Sheen	2 coats		USG Vinyl Exterior Paint	NR/w	B1, R1, S1	½	8	350
	Medium Lustre	2 coats		USG Latex House Paint	NR/w	B1, R1, S1	½	8	350
Old, Light Chalk—Block, Brick, Stucco or Poured Masonry	Low Sheen	Clean, dust-free, wire brush off chalk, 2 coats		USG Vinyl Exterior Paint	NR/w	B1, R1, S1	½	8	350
	Medium Lustre	Clean, dust-free, wire brush off chalk, 2 coats		USG Latex House Paint	NR/w	B1, R1, S1	½	8	350
Old, Heavy Chalk—Brick, Block, Stucco or Poured Concrete	Low Sheen or Medium Lustre	Clean, dust-free, wire brush off chalk, apply USG Penetrating Sealer & 2-coat finish		USG Vinyl Exterior Paint	NR/w	B1, R1, S1	½	8	350
	Gloss	USG Penetrating Sealer		IMPERIAL Gloss House Paint	NR/ms	B1, S2	12	48	450
Old or New (unpainted) Block, Brick, Stucco or Poured Concrete	Smooth (Cement)	Clean, free of dust, porous—pre-wet, post-wet		CEMENTICO Coating	W	B1, S1	—	24	16-24 (per lb.)
	Sanded (Cement)	Clean, free of dust, porous—pre-wet, post-wet		DURA-DRI Coating	W	B, T	—	24	16-24
New—Unpainted Wood	Low Lustre	USG Low-Lustre House Paint		USG Low-Lustre House Paint	NR/ms	B only	2	24	450
	Medium Lustre	Dry, clean, apply one coat USG House Primer #894, 1 or 2 coats finish paint		USG Latex House Paint	NR/w	B1, R1, S1	½	8	400
	Gloss	IMPERIAL House Primer		IMPERIAL Gloss House Paint	NR/ms	B1, S1, R2	12	48	450
	Clear Gloss	Prime with USG Wood Stain		USG Polyurethane Clear Finish	NR	B1, R1, S1	2	12	500
Repaint—Wood Medium Chalk	Low Lustre	Wipe off chalk and dirt		USG Low-Lustre House Paint	NR/ms	B1, S1, R1	2	24	450
	Medium Lustre	Dust off dirt and cobwebs		USG Latex House Paint	NR/w	B1, R1, S1	½	8	400
	Gloss	Wire brush, wipe off chalk and dirt, prime bare spots		IMPERIAL Gloss House Paint	NR/ms	B1, S1, R2	12	48	450
Repaint—Wood Heavy Chalk	Low Lustre	Wire brush, dust and clean		USG Low-Lustre House Paint	NR/ms	B1, S1, R2	2	24	450
	Medium Lustre	Wash with hose and rag, flush with water		USG Latex House Paint	NR/w	B1, R1, S1	½	8	400
	Gloss	Wire brush, dust, prime with IMPERIAL House Primer		IMPERIAL Gloss House Paint	NR/ms	B1, S1, R2	12	48	450
Pre-Primed Wood Siding	Low Lustre	None		USG Low-Lustre House Paint	NR/ms	B1, S1, R1	2	24	450
	Medium Lustre	None		USG Latex House Paint	NR/w	B1, R1, S1	½	8	400
	Gloss	None		IMPERIAL Gloss House Paint	NR/ms	B1, S1, R1	12	48	450
Hardboard Siding	Medium Lustre	USG Exterior House Primer #894		USG Latex House Paint	NR/w	B1, R1, S1	½	8	400
Asphalt	Low Sheen Medium Lustre	Clean, firm, tight backing		USG Vinyl Exterior or Latex House Paint	NR/w	B1, R1, S1	½	8	400
Metal	Gloss	See use of specific primers under "Interior Walls" above		METAL COAT Enamel	NR/ms	B1, S1, R2	2	24	600

NOTES: "Drying Time" and "Coverage" estimates are based on average conditions. Touch = furniture can be returned to living areas.

Abbreviations, Method of Application: B = brush, R = roller, S = spray, T = trowel, O = other; 1, 2, 3 = order of preference. Abbreviations, Thinners: NR/w—Not recommended, use water sparingly; NR/ms—Not recommended, use mineral spirits if needed; SS/USG—Special Solvent manufactured by U.S. Gypsum; W—water per directions.

(*continued from page 3*)

USG Exterior House Primer #894—oil-base primer to prepare new or chalky wood surfaces for USG Latex House Paint or exterior oil paints. Lead-free, blister-resistant, breather-type coating. White only.

USG Block Filler—conceals voids, fills pores and provides uniform finish over interior, exterior masonry and other rough surfaces. Not a waterproofing material; may be coated with any paint except cement bonding type—IMPERIAL House Paint or USG Latex House Paint recommended for exteriors. May be tinted. Available either aggregated or unaggregated.

DURA-STOP* Compound—a quick-setting hydraulic powder compound used to control water penetration, plug cracks and openings in masonry. Also excellent for anchoring fixture bolts. Natural color, may be overcoated with DURA-DRI* Coating in colors (see Exterior and Masonry Coatings).

6. Special Coatings

USG Epoxy Coatings System protects walls in high-traffic areas of schools, commercial and industrial buildings with economies not previously possible. Provides a glossy ceramic-like appearance of extreme durability and abrasion resistance—highly sanitary and resistant to mildew, fungi, alkali and acids. Non-absorbent, completely seals surface with a non-porous, heat-resistant vapor barrier. Consists of:

USG Epoxy Block Filler fills and levels irregular masonry surfaces, also produces textured effect on smooth surfaces. Spray application usually preferable; neutral color. **USG Block Filler Activator** must be added to produce desired curing and hardness.

USG Epoxy Enamel is applied over USG Epoxy Block Filler, and on smooth surfaces as well; 9 colors. It is blended with **USG Epoxy Enamel Activator** to develop the final surface. **USG Epoxy Solvent** must be used to thin both the Epoxy Enamel and Block Filler for spray application, and for equipment cleaning.

Hard-wear surface of USG Epoxy Enamel

METAL COAT Enamel—a durable gloss finish, highly weather resistant, for interior and exterior metal surfaces. Spirit-thinned; soya alkyd resin vehicle. Comes in 11 safety colors ideal for equipment identification in plants. Used over any of three rust-retardant special primers: **Zinc Chromate,** for bright metals; **Iron Oxide,** for ferrous metals; **Zinc Dust,** for zinc and galvanized surfaces. METAL COAT products also include **USG High Heat-Resistant Aluminum Coating,** formulated to withstand temperatures of up to 1000° F. on interior bright metal surfaces—steam lines, boiler casings, drums, etc.

SHEETROCK Smooth Coating—a new powder compound, mixed with water, spray-applied to drywall or plaster to provide an ideal base for decoration where a smooth, unblemished wall or ceiling is desired. Quick, economical means of obtaining an interior paintable surface.

Industrial Finishes—Shop coats, primers and other special coatings available through Warren Paint and Color Division, Nashville, Tennessee.

general painting specifications

I. scope—Unless otherwise indicated, all (describe areas to be prepared and finished) are included.

II. general conditions—During cold weather provide thermostatically controlled heat to maintain (50°) (55°) (60°)F. minimum temperature until building is occupied. Open flame, unvented burners shall not be used to provide heat. Adequate ventilation shall be provided at all times for proper drying. (For exterior work, specify minimum application temperature.)

III. materials

a. Deliver in original unopened containers.

b. Store to protect from damage by elements and tampering.

c. Use all materials in strict accordance with manufacturer's directions as furnished at time of material delivery.

d. (Specify materials from product descriptions and Selector Guide in this catalog).

IV. surface preparation

a. Before painting, prepare surfaces as required in product directions. The base surface must be sound, firm and dry, clean and free of dust, dirt, grease or other foreign material. (After following preparation steps, specify surface treatment from Selector Guide, pages 4 and 5; specify application according to manufacturer's directions.)

b. Interior plaster surfaces—on *old plastered walls,* fill all hairline cracks with TEXOLITE* Spackling Putty. Fill larger cracks with USG Patching Plaster. Sand rough edges and allow sufficient time for spackled and filled areas to dry. Dull the glossy areas by rubbing lightly with fine steel wool or washing with a strong washing powder solution followed by a thorough rinse with clean water. Allow to dry before proceeding. Touch up the spackled and patched cracks and areas with SHEETROCK* Sealer. Allow to dry. Follow with a brushed-on coat of SHEETROCK Sealer over all areas. In *newly plastered surfaces,* treat cracks and gouges in the same manner as for old walls. Apply a coat of TEXOLITE Primer-Sealer. When reinforcement of the white coat is needed, use USG Penetrating Sealer.

c. IMPERIAL thin-coat plaster surfaces—proper sealing of surface is essential. Surface must be sound and dry as outlined above; repair minor imperfections with TEXOLITE Paste Spackling Compound or USG All Purpose Ready-Mixed Joint Compound. When dry, apply one or more coats of TEXOLITE Primer-Sealer. Tint the primer-sealer coat to aid in detection and repair of surface defects; seal any patches or fills revealed after first primer-sealer application. Either

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water-thinned or solvent-thinned flats or enamels may be used for finish coats.

d. Interior gypsum wallboard surfaces—prepare joints and nailheads with (PERF-A-TAPE*) (DURABOND*) Joint System (see Specifications in USG Folder f-1887).

e. Interior wood surfaces (except floors)—in new wood not previously painted, sand smooth and touch up knots, sap streaks and pitch spots with shellac.

f. Interior metal surfaces—remove grease, oil and plaster spatterings, rust and mill scale.

g. Other interior and exterior surfaces—prepare according to directions of surface treatment or finish product.

V. application

a. Apply according to product directions (except where you may wish to specify in detail on specialty applications shown below).

b. SHEETROCK W/R Gypsum Wallboard—(see Specifications in USG Folder f-1877).

c. ULTRAWALL Panels—additional surface protection of predecorated woodgrained gypsum wallboard may be provided by two types of coatings:

1. Apply (one) (two) coat(s) of clear varnish—USG Satin Finish Varnish for low-gloss coating, or USG Polyurethane Clear Finish Varnish for high-gloss coating.

2. Apply two coats of paint or opaque coating to surface not previously treated with clear coating—USG Semi-Gloss Enamel and TEXOLITE Alkyd Latex Paint.

d. Texture and Epoxy Finishes, Wood Stains and Varnishes—(select finish and product desired from Selector Guide, pages 4 and 5). Upon request, the contractor shall provide sample panels coated with the product specified, which, when approved, shall be the standards of finish to be provided on this work.

e. IMPERIAL QT Texture Finish

1. Unless otherwise indicated, all interior gypsum wallboard or poured concrete ceilings are included.

2. All interior concrete ceilings shall be treated to remove form oils and greasy deposits. Any high plane differences resulting from forms or other causes shall be ground down to same level as adjacent area. If additional filling or leveling is required, this shall be accomplished by using DURABOND* Joint Compound, COVER COAT Compound or USG Block Filler—as manufactured by the United States Gypsum Company, and applied in as many coats as needed to provide a hollow-free, hump-free, crack-free fill with no edge joining that will show through final decoration.

3. In areas which will be exposed to sharp, angular lighting, special care must be exercised to provide a smooth plane base that is free of surface irregularities.

4. In drywall construction, treat joints and nail heads with PERF-A-TAPE* Joint System as manufactured by the United States Gypsum Company, following manufacturer's instructions. Scratches or scuffs in drywall surface must be smoothed and spackled.

5. Full coat of PRO-KYD Alkyd Flat Wall Paint shall be applied, followed, when dry, with IMPERIAL QT Texture Finish mixed on the job in strict accordance with the manufacturer's printed directions.

6. To be applied by spray only at a rate not to exceed 8 sq. ft. per lb. and in accordance with the directions printed on the container. The material is to be applied in such a fashion that it will blend uniformly, that there are full uniform coatings and that there shall be no starved spots or other evidence of thin application. The texture shall be uniform and free of application patterns. The spray equipment shall be of such size and type as to provide acceptable results.

f. USG Epoxy Coatings System

Note to architect: Application of USG Epoxy Enamel at a rate between 190-220 sq. ft. per activated gallon provides a dry film thickness of approximately 5 mils per coat applied. When greater coating thickness is desired, specify additional coats to attain the film thickness wanted. On masonry, cement block and similar rough surfaces, USG Epoxy Block Filler develops a film thickness approaching 8 to 10 mils when applied at a rate between 60 and 100 sq. ft. per activated gallon.

1. As indicated in the respective sections, gypsum wallboard, concrete and cinder blocks, poured concrete walls and ceilings, plaster, asbestos board, masonry, hardboard, plywood interior and exterior surfaces shall be coated as specified.

2. Application shall be attempted only when the interior temperature can be continually maintained in a uniform range above 50°F. for a minimum of 24 hours before, during and after application, and when exterior surfaces and air temperature will remain above 50°F. Strong drafts are to be avoided during application, but adequate ventilation must be provided during application, and for at least 24 hours after application is completed. When there has been rain or snow for several days before, during and after application, then the period of ventilation shall be extended to at least 72 hours after application.

3. Cement Block and Brick—remove protruding mortar droppings, splatters. Cleanly tool or wipe mortar joints smooth and flush. Repair blemishes. (System A or D below.)

4. Concrete Floors and Swimming Pools—remove all dirt and grease. New or aged concrete should be etched with a 15% to 20% solution Muriatic Acid. Mop on, let stand for 20 minutes, thoroughly rinse with 5% to 10% solution household ammonia with water, and allow to dry. (System A or D below.)

5. Metal—completely remove all scale, rust, oil and grease by wire brushing or sand blasting as required to provide a clean surface. Then apply a full, uniform coat of USG Epoxy Rust Inhibiting Primer to provide corrosion and chemical resistance. Allow prime coat to dry thoroughly before proceeding with next application. (System A below—one coat only if appearance is satisfactory.)

6. Gypsum Wallboard—joints and nailhead treatment must be thoroughly dry. Remove all dust, other foreign matter from entire surface. (System A, B, C or D below.)

7. Hardboards, Cement and Asbestos Boards—surfaces must be clean and dry. (System A, C or D below for cement, System A, B or D for hardboard.)

8. Plaster-Lime Putty—must be clean, dry, firm, free of dust or chalk and in paintable condition. On unpainted surfaces meeting these conditions apply one coat of USG Penetrating Sealer. After this has dried the prescribed time, proceed with decoration. (System C below.)

9. Wood—sand smooth, dust free. (System A, C or D below—sand after first coat if rough.)

10. Previously Painted Surfaces—after proper cleaning, test USG Epoxy Enamel on small area to determine compatibility with old coating. No lifting of old paint shall occur. If lifting appears, remove old coating and treat as new surface (otherwise, use System A or D below.)

11. Over gypsum wallboard surfaces prepared as above and completely dried, apply USG Epoxy Enamel by means of the following system:

System A—Apply one coat of USG Epoxy Enamel used as prime coat followed when cured by one or more additional coats of Epoxy Enamel.

System B—Apply one coat of TEXOLITE Primer-Sealer, followed when dry by one or more coats of USG Epoxy Enamel.

System C—(cases where additional substrate protection or hardness is desired). Apply one coat of USG Penetrating Sealer followed when dry by one or more coats of USG Epoxy Enamel.

12. Over cement block and brick surfaces, apply as follows:

System D—Fill surface with one or more applications of USG Block Filler followed when dry with one or more coats of USG Epoxy Enamel, followed if desired with spatter coat of a complementary color.

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g. Metal Surfaces

1. Flow on METAL COAT (Iron Oxide) (Zinc Chromate) (Zinc Dust) Primer in full uniform coat. Provide ample circulating ventilation during and after application.

2. Apply METAL COAT Enamel by (brush) (roller) (spray).

3. Apply 2 coats of USG High Heat-Resisting Aluminum Coating by (brush) (spray) to approx. 1 mil dry film thickness. Apply paint only when surface temperature is below 140°F. Use respirator; provide adequate ventilation during and after application.

h. Acoustical Plasters—painting of AUDICOTE* or HI-LITE* Acoustical Plasters shall proceed only after surfaces have been properly vacuum cleaned. For the first coat, TEXOLITE Standard Paint, in a white or light tint as specified, shall be mixed 1:1 with water and spray-applied. (For the second coat, mixture shall be 1 part TEXOLITE Standard Paint to 2 parts water.) Standard spray atomizing equipment shall be used with sufficient fluid and pressure for light, uniform coverage. Care shall be taken to avoid piling up paint at laps, joinings, or elsewhere. Paint shall be "dusted" in alternating fashion from both sides of raised texture.

i. Radiant Heat Ceilings—after sealer coat of TEXOLITE Primer-Sealer has dried, ( ) finish coats of GRAND PRIZE Latex Wall Paint shall be applied. (With installations of THERMALUX Electric Radiant Heating System, painting shall proceed only when THERMALUX system, thermostat and air temperature are at equilibrium above 50°F.) (With installations employing RED TOP* Radiant Heat Plaster, heating cable shall be de-energized for at least 6 hours before each finish coat is applied, and entire ceiling shall have a uniform temperature.)

j. Poured Gypsum Roof Decks—in finishing the underside of USG formboards supporting poured gypsum roof decks, a breathing type paint film and fortification against mildew are required. On all formboard types except asbestos-cement, apply TEXOLITE Alkyd Latex or USG Vinyl Wall Paints, reinforced by job-site addition of ½ oz. Nuodex Super Ad-It inhibitor per gal. of paint. On asbestos-cement formboard, apply USG Vinyl Exterior or USG Latex House Paints; additional inhibitors not required.

k. Precast Gypsum Roof Decks—before painting, USG Metal Edge Gypsum Plank must be dry and galvanized edging must be free of grease or oil. Paint edging with a zinc dust metal primer; seal gypsum surfaces with SHEETROCK Sealer. Allow metal primer and sealer to dry. Apply 1 or 2 coats GRAND PRIZE Latex Wall Paint or USG Alkyd Flat Oil Paint. If it is necessary to paint before plank is dry, prime metal edging as above, paint edging and gypsum with TEXOLITE Standard casein paint reinforced with 1½-oz. Dowicide "G" fungicide per gallon of paste.

VI. Federal specification paints and others—ask your U.S.G. representative for recommendations, color samples, etc.

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USG® Sound Control Products

f 1927

A.I.A. File No. 39-B

description and utility

Whatever the ceiling requirements—sound absorption or attenuation, fire protection, heating and cooling—United States Gypsum offers the industry's finest sound control products to fulfill the function.

Not only was U.S.G. the pioneer in incombustible acoustical ceiling tile, but its continual research and development have anticipated the tremendous broadening of architectural needs in sound control. Today's product line is the most complete ever offered, supplied from the industry's most modern production facilities. Ceiling surfaces of classic design and functional beauty are included, in a range of textures and patterns to suit virtually any room and any condition. In this catalog these products are presented in six groups:

1. ACOUSTONE* Mineral Acoustical Tile, the country's most-demanded prestige tile—12 standard patterns, special types for fire, sound attenuation, air distribution requirements

2. AURATONE* Acoustical Panels and Tile, felted mineral fiber for lay-in applications—4 patterns

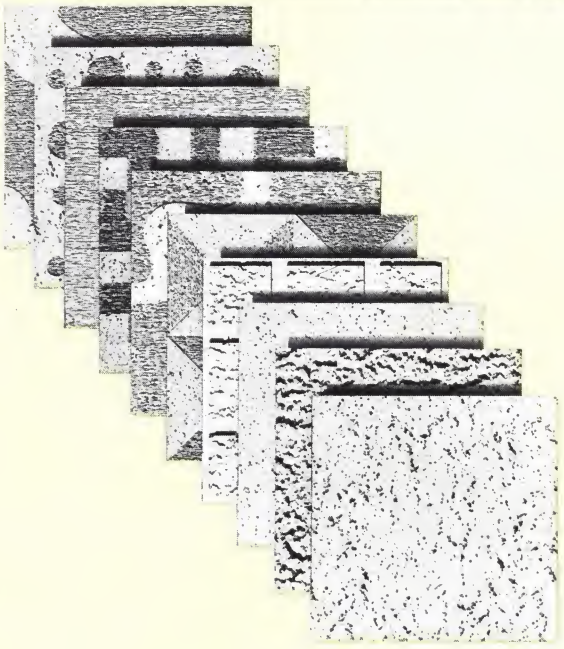
3. AUDITONE* Acoustical Tile, economical wood fiber material made in 4 styles

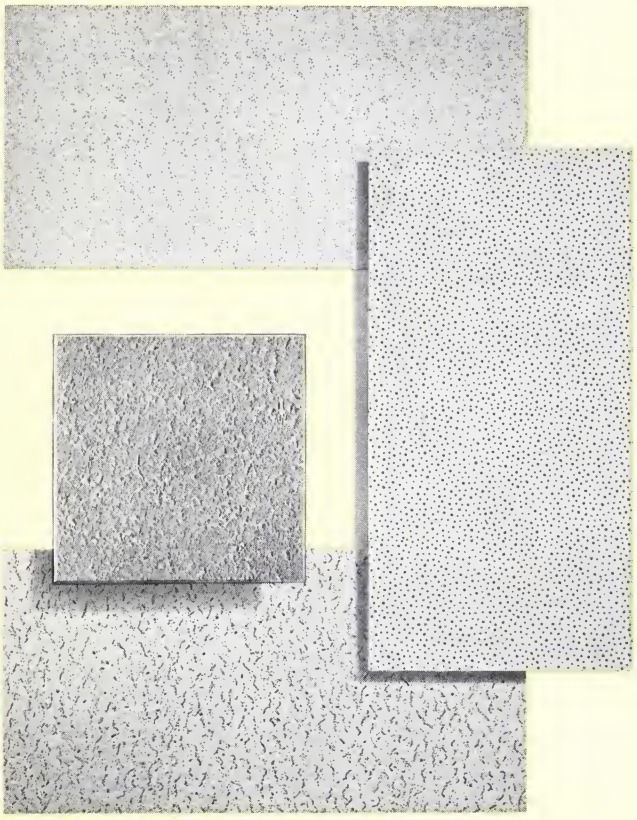
4. PERFATONE* Acoustical Units, perforated metal pans and suspension system—4 surface patterns

5. Ceiling Boards—gypsum and asbestos, for lay-in application in exposed grid systems

6. Metal Accessories—channels, splines, clips, runners, spacers for USG suspension systems

Modern architectural practice has often created a "critical lighting" condition for acoustical ceilings. It is important to visualize the final room furnishings and lighting when selecting a tile or suspension system. When the ceiling membrane is installed with complementary components that are designed as part of an integrated system, the architect gains assurance of fine appearance as well as reliable performance. U.S.G. has developed four basic ceiling systems into which its sound control products and accessories are engineered. These are covered in separate USG Systems Folders, numbered as listed below:





—ACOUSTONE Tile Suspension Systems, b-1557
including concealed Z-spline, concealed accessible and exposed Z-spline assemblies

—AURATONE Panel Suspension Systems, b-1547
including exposed grid lay-in application

—AIRSON* Air Distribution System, b-1567
acoustical treatment, heating and cooling combined in a ceiling of tile or panels

—PERFATONE Metal Pan System, this folder, page 9

In addition, adhesive application is covered in this Catalog's Specifications section, page 11; another popular method of ceiling sound control, by means of acoustical plaster, is treated in USG Folder f-1857. A summary of types and sizes of USG Sound Control Products appears here on page 2; comparative data on sound absorption and attenuation, flame resistance and light reflection on pages 3 and 4.

United States Gypsum ceiling systems are sold not simply as products, but as a complete package. They are installed by expert contractors experienced in each application. Your U.S.G. Sales Engineer will be glad to make recommendations.

general limitations

ACOUSTONE, AURATONE and AUDITONE acoustical materials should not be used: (a) where exposed to steam or very high humidity; (b) below wainscot height or exposed to impact, abrasion or tampering.

(for Types and Functions, see page 5)

A.I.A. File No. 39-B

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USG Sound Control Products—types and sizes

product	pattern	thickness	size (in.)	edge	installation	conductance (c)	weight psf
ACOUSTONE* "F" and ACOUSTONE F-PC Mineral Tile	Fissured	¾"	12x12, 12x24, 12x36, 12x48, 24x24	sq. or bev. bev.	adhesive, conc. Z, conc. acc., E-Z-S or exp. grid	0.47	1.30
Specialty ACOUSTONE and ACOUSTONE-PC	Glacier	¾" (2)	12x12, 12x24, 12x36, 12x48, 24x24	sq.	adhesive, conc. Z, E-Z-S or exp. grid	0.47	1.40
	Finesse	¾"	12x12, 12x24, 12x36, 12x48	bev.	adhesive, conc. Z or E-Z-S	0.47	1.40
	Shadow Line	¾"	12x24, 24x24	sq.	E-Z-S or exp. grid	0.47	1.40
	Domino	¾"	12x12	sq.	adhesive or conc. Z	0.47	1.39
ACOUSTONE db and ACOUSTONE db-PC	Fissured or Finesse	¾"	12x12, 12x24 24x24	sq. or bev. bev.	conc. Z, E-Z-S, conc. acc. or exp. grid	0.47	1.30
	Glacier	¾" (2)	12x12, 12x24, 12x36, 12x48, 24x24	sq.	conc. Z, E-Z-S or exp. grid	0.47	1.60
ACOUSTONE 90 and ACOUSTONE 90-PC	Fissured, Glacier or MOTIF'D (below)	¾"	12x12	sq.	conc. Z	0.47	1.30
ACOUSTONE 120 and ACOUSTONE 120-PC	Fissured, Glacier or MOTIF'D (below)	¾"	12x12	sq.	conc. Z	0.47	1.30
ACOUSTONE 180 and ACOUSTONE 180-PC	Fissured, Glacier or MOTIF'D (below)	¾"	12x12	sq.	conc. Z	0.47	1.30
AIRSON* ACOUSTONE (1) (A-2, A-5 and unslotted) and AIRSON ACOUSTONE-PC	120 Fissured	¾"	12x12	sq.	conc. Z	0.47	1.30
	Reg. Fissured	¾"	12x12, 12x24, 24x24	sq. or bev.	conc. Z, E-Z-S or exp. grid	0.47	1.30
	Glacier	¾" (2)	12x12, 12x24, 24x24	sq.	conc. Z or exp. grid	0.47	1.45
	MOTIF'D (below)	¾"	12x12	sq.	conc. Z	0.47	1.35
MOTIF'D ACOUSTONE*	#1 Checkmate, #2 Georgian, #3 Cadence, #11 Harlequin, #19 Striated, #33 Galaxy, #40 Fantasia	¾"	12x12	sq.	adhesive or conc. Z	0.47	1.35
ACOUSTONE Space Unit (1)	Finesse, Striated, Glacier	2"	12x12	sq.	special mounting device	0.18	3.85
AURATONE* Panels-Regular and AURATONE FIRECODE*	Pin-Perf., Fissured or Snowdrift	½"	24x24, 24x48 (2)	sq.	exposed grid	0.68	.85
	Pin-Perf. or Snowdrift	⅝"	24x24, 24x48 (2)	sq.	exposed grid	0.54	.90 (3)
	Random-Perf.						.90 (3)
	Fissured						.95 (3)
AIRSON AURATONE Panels-Regular and FIRECODE (1) (A-2, A-5 and Unslotted)	Pin-Perf.	⅝"	24x24 (2)	sq.	exposed grid	0.54	.90 (3)
	Fissured		24x48 (2)				.95 (3)
AURATONE Tile	Pin-Perf. or Random	½"	12x12	bev.	adhesive	0.68	.80
	Pin-Perf. or Random (reg. or PC)	⅝"	12x12, 24x24	bev.	adhesive, conc. Z conc. Z or acc., E-Z-S	0.54	.90
	Snowdrift		12x12	bev.	adhesive, conc. Z		.90
	Fissured	¾"	12x12 24x24	bev.	adhesive, conc. Z conc. Z or acc., E-Z-S	0.46	1.10
	Pin-Perf. or Random (reg. or PC)		12x12	bev.	adhesive, conc. Z		
AURATONE FIRECODE Tile	Fissured or Pin-Perf.	⅝"	12x12	T&G	conc. Z	0.69	1.15
	Fissured or Pin-Perf.	¾"	12x12	T&G	conc. Z	0.57	1.40
AUDITONE* Tile and Panels	Perf., Random Perf., Pin-Perf., Plain	½" & ¾"	12x12, 12x24 (4)	butt bev. or T & G	adhesive, furred, or metal susp.	0.76(½") 0.51(¾")	.77 to 1.00
	Fissured	9/16"	12x12, 24x24, 24x48	butt bev., sq., K&R, T&G		0.68	.80 to 1.00
	Plain, Snowdrift	½"	24x24, 24x48	sq.	exp. grid		.90
PERFATONE* Acoustical Units (1)	Perf. (diagonal, square or random styles) and Unperf.	1 9/16"	12x12 12x24 (4) 12x36 (4)	butt bev.	metal T-bar susp.	0.21 (pad only)	.52 to 1.31
PERFATONE Units Fire-rated (1)	Perf. (diagonal or random styles)	2 13/16"	12x24 (4)	butt bev.	metal T-bar susp.	0.21 (pad only)	1.10
SHEETROCK* Ceiling Board (5)	Plain	⅜" & ½"	24x24 (2) 24x48 (2)	sq.	exposed grid	3.7 2.8	1.75 2.00
USG Asbestos Board	Perf. and Unperf.	3/16"	24x24 (2) 24x48 (2)	sq. or bev.	exposed grid	0.21 (pad only)	1.50 to 1.75

NOTE: (1) Accessories available—see Descriptions. (2) Nominal dimensions in some styles. (3) Weight psf for these patterns in FIRECODE panels ranges from 1.1 to 1.3 for ⅝" panels, from .90 to 1.00 for ½" panels. (4) Tile is centerscored to represent 12"x12" units.
Abbreviations: PC—plastic coated; conc. Z—concealed Z-spline; conc. acc.—concealed accessible; E-Z-S—exposed Z-spline; exp. grid—exposed grid; susp.—suspension; att.—attachment.

Sound Absorption—Flame Resistance—Light Reflection

product	thick-ness	mount-ing no.	sound absorption coefficients 125 cps	250 cps	500 cps	1000 cps	2000 cps	4000 cps	NRC range	light refl. class	flame resistance SS-A-118b class	flame spread E84-61T index	unit size tested
ACOUSTONE* "F" Tile Fissured	¾"	1	.03	.27	.83	.99	.82	.71	.70-.80	A	A	15	12"x12"
		7	.68	.67	.65	.84	.87	.74		A	A	15	12"x12"
ACOUSTONE "db" Fissured	¾"	7	.49	.40	.69	.99	.90	.83	.70-.80	A	A	15	12"x12"
		7	.58	.48	.67	.99	.92	.85		A	A	15	12"x24"
ACOUSTONE "90" Fissured (1)	¾"	7	.83	.73	.68	.87	.93	.78	.75-.85	A	A	15	12"x12"
ACOUSTONE "120" Fissured (2)	¾"	7	.45	.46	.72	.97	.87	.90	.70-.80	A	A	15	12"x12"
ACOUSTONE "180" Fissured	¾"	7	.45	.48	.62	.97	.96	.96	.70-.80	A	A	15	12"x12"
ACOUSTONE "Glacier" Texture (3)	¾"	1	.04	.20	.73	.99	.88	.89	.65-.75	A	A	—	12"x12"
		7	.60	.73	.73	.93	.88	.90	.75-.85	A	A	—	12"x12"
ACOUSTONE "db" "Glacier" (3)	¾"	7	.30	.46	.77	.99	.89	.90	.75-.85	A	—	—	12"x12"
ACOUSTONE "Finesse"	¾"	7	.78	.57	.59	.73	.70	.60	.60-.70	A	A	15	12"x12"
ACOUSTONE "PC" Fissured	¾"	1	.22	.21	.78	.99	.78	.59	.65-.75	A	A	25	12"x12"
		7	.70	.63	.67	.82	.86	.62	.70-.80				
MOTIF'D ACOUSTONE*	¾"	1	.03	.26	.77	.93	.83	.78	.65-.75	A	A	15	12"x12"
		7	.80	.69	.66	.86	.90	.87	.75-.85	A	A	15	12"x12"
MOTIF'D ACOUSTONE "db"	¾"	7	.58	.46	.69	.91	.80	.76	.65-.75	A	—	5	12"x12"
AIRSON* ACOUSTONE "A-2" Fissured, slotted (4)	¾"	7	.85	.49	.68	.98	.92	.88	.70-.80	A	—	15	12"x12"
AIRSON ACOUSTONE "A-5" Fissured, slotted (5)	¾"	7	.81	.48	.65	.94	.93	.84	.70-.80	A	—	15	12"x12"
AURATONE* Regular Panel Fissured	⅝"	7	.32	.43	.70	.95	.81	.75	.65-.75	A	A	25	24"x48"
	½"	7	.24	.35	.53	.88	.82	.72	.60-.70	A	A	25	24"x48"
AURATONE Regular Panel Pin-Perforated	⅝"	7	.30	.43	.74	.95	.73	.55	.65-.75	A	A	25	24"x48"
	½"	7	.29	.34	.59	.91	.70	.49	.60-.70	A	A	25	24"x48"
AURATONE Regular Panel Random-Perf. (7)	⅝"	7	.40	.46	.60	.99	.87	.58	.70-.80	A	A	25	24"x48"
AURATONE Regular Panel "Snowdrift" Pin-Perf.	⅝"	7	.30	.38	.74	.83	.63	.47	.60-.70	A	A	25	24"x48"
	½"	7	.27	.31	.61	.83	.64	.48	.55-.65	A	A	25	24"x48"
AURATONE FIRECODE* Panel Fissured	⅝"	7	.24	.30	.72	.89	.73	.67	.60-.70	A	A	25	24"x48"
	½"	7	.27	.30	.55	.85	.74	.67	.55-.65	A	A	25	24"x48"
AURATONE FIRECODE Panel Pin-Perforated	⅝"	7	.25	.33	.73	.88	.70	.55	.60-.70	A	A	25	24"x48"
	½"	7	.27	.29	.58	.86	.70	.54	.55-.65	A	A	25	24"x48"
AURATONE Regular Tile Pin-Perforated	¾"	7	.41	.43	.68	.86	.73	.59	.65-.75	A	A	25	12"x12"
	⅝"	7	.48	.45	.62	.87	.72	.56	.60-.70	A	A	25	12"x12"
	⅝"	1	.04	.16	.65	.97	.70	.50	.55-.65	A	A	25	12"x12"
	½"	1	.03	.15	.58	.98	.71	.49	.55-.65	A	A	25	12"x12"
AURATONE Regular Tile Fissured	¾"	7	.42	.42	.70	.83	.79	.75	.65-.75	A	A	25	12"x12"
AURATONE Regular Tile Random-Perf. (7)	¾"	7	.43	.34	.62	.93	.79	.58	.60-.70	A	A	25	12"x12"
	½"	1	.09	.24	.60	.63	.62	.54	.45-.55	A	A	25	12"x12"
AURATONE FIRECODE Tile Pin-Perforated	¾"	7	.38	.39	.66	.88	.72	.51	.60-.70	A	A	25	12"x12"
	⅝"	7	.39	.35	.56	.86	.72	.49	.55-.65	A	A	25	12"x12"
AURATONE FIRECODE Tile Fissured	¾"	7	.36	.39	.66	.87	.74	.62	.60-.70	A	A	25	12"x12"
	⅝"	7	.36	.36	.55	.86	.77	.63	.60-.70	A	A	25	12"x12"
AURATONE FIRECODE Tile Random-Perf. (7)	¾"	7	.34	.38	.69	.92	.71	.53	.65-.75	A	A	25	12"x12"
AUDITONE* Tile Random-Perf. (8, 9)	½"	1	.25	.28	.62	.58	.66	.68	.50-.60	A	C, D		12"x12"
		2	.15	.67	.46	.52	.66	.71	.55-.65				12"x12"
	¾"	1	.19	.38	.68	.67	.78	.73	.60-.70		C, D		12"x12"
		2	.25	.65	.51	.73	.76	.78	.60-.70				12"x12"
		7	.48	.43	.57	.76	.81	.69	.60-.70				12"x24"
AUDITONE Tile Pin-Perforated (7, 9)	½"	1	.14	.25	.68	.73	.55	.35	.50-.60	A	C, D		12"x12"
		2	.17	.50	.63	.58	.56	.34	.50-.60				12"x12"
	¾"	1	.17	.38	.78	.71	.55	.46	.55-.65		C, D		12"x24"
		2	.15	.65	.66	.65	.51	.40	.55-.65				12"x12"
		7	.31	.40	.64	.72	.57	.62	.55-.65				12"x24"
PERFATONE* Acoustical Units Pin-Perforated (10)	1 9/16"	7	.56	.90	.85	.97	.74	.71	.85-.95	A	A	20	12"x24"
Fire-Rated PERFATONE Diagonal Perf. (11, 12)	2 13/16"	7	.66	.72	.96	.99	.83	.67	.85-.95	A	—	20	12"x24"

NOTE: All surfaces tested were painted. Mounting No. 1—adhesive application to gypsum board. Mounting No. 2—stapling or nailing to wood strips. Mounting No. 7—metal suspension system. Also see Footnotes, page 4.

*Reg. U.S. Pat. Off.

Sound Attenuation Properties

product	thick-ness	mount-ing	sound attenuation—decibels 125	175	250	350	500	700	1000	1400	2000	2800	4000	STC	unit size tested
ACOUSTONE* "F" Tile	¾″	IC	23	27	26	23	26	26	29	33	38	45	52	29	12″x24″
Fissured		Ad	25	33	36	41	46	49	54	60	60	64	61	47	12″x12″
ACOUSTONE "db"	¾″	IC	26	32	33	33	37	42	45	50	56	63	59	39	12″x12″
Fissured		IC	31	36	33	34	41	44	49	54	56	64	59	40	12″x24″
		IE	27	36	32	32	37	39	42	50	53	62	59	38	12″x24″
ACOUSTONE "120" Fissured	¾″	IC	27	30	33	33	38	41	44	50	54	62	59	39	12″x12″
ACOUSTONE "db" "Glacier" foil-backed (3)	¾″	IC	24	30	31	30	34	37	41	45	50	58	54	36	12″x12″
ACOUSTONE "Finesse"	¾″	IC	26	30	30	28	30	32	35	41	48	59	60	34	12″x12″
MOTIF'D ACOUSTONE* "db"	¾″	IC	26	34	32	33	38	41	45	50	54	62	59	39	12″x12″
AIRSON* ACOUSTONE "A-2" Fissured, slotted	¾″	IC	25	31	30	30	34	36	40	46	51	59	58	36	12″x12″
AIRSON ACOUSTONE "A-5"	¾″	IC	23	31	27	30	33	37	40	49	54	58	56	36	12″x12″
Fissured, slotted		IC	21	27	24	25	29	31	34	41	45	54	54	31	12″x12″
AURATONE* Regular Panels															24″x48″
Fissured	⅝″	IE	33	36	32	35	38	43	48	53	55	58	58	41	
		CE	29	35	29	34	34	38	45	46	56	55	54	38	
	½″	CE	29	35	30	35	36	39	45	48	52	52	50	40	
Pin-Perforated	⅝″	IE	34	37	33	36	40	43	47	53	54	58	58	42	
		CE	29	38	32	34	36	39	45	49	55	53	51	40	
	½″	CE	29	33	30	35	35	38	44	46	53	53	50	39	
Random-Perf. (7)	⅝″	IE	33	34	31	35	38	41	46	52	54	60	59	41	
AIRSON A-5 Fissured	⅝″	CE	25	34	27	31	33	38	42	44	49	50	47	36	
AIRSON A-2 Fissured	⅝″	CE	27	34	27	31	32	37	44	47	52	52	50	36	
AURATONE FIRECODE* Panels															24″x48″
Fissured	⅝″	CE	29	34	32	38	38	43	47	48	52	53	52	42	
	½″	CE	29	38	31	35	36	41	45	47	53	53	50	40	
Pin-Perforated	⅝″	CE	31	38	35	39	40	46	47	48	53	53	49	44	
	½″	CE	29	39	35	36	38	43	46	49	53	53	51	42	
Random-Perf. (7)	⅝″	IE	29	34	34	37	41	43	47	52	53	58	57	43	
AIRSON A-5 Fissured	⅝″	CE	25	33	26	30	32	35	41	48	51	52	50	37	
AIRSON A-2 Fissured	⅝″	CE	28	36	31	33	36	40	46	46	52	53	52	39	
AURATONE Regular Tile															
Fissured	¾″	CCF	30	36	35	41	40	44	50	54	57	63	55	44	12″x12″
	¾″	CCT	33	35	35	42	44	47	52	58	59	63	57	48	24″x24″
Pin-Perforated	⅝″	CCF	29	33	29	34	34	37	42	49	56	58	54	38	12″x12″
	⅝″	CCT	30	34	31	38	37	42	49	51	61	62	62	41	24″x24″
AURATONE FIRECODE Tile															
Fissured	¾″	CCF	31	34	32	39	40	43	49	51	58	63	62	44	12″x12″
	⅝″	CCF	36	38	31	39	41	42	50	55	62	67	64	45	12″x12″
Pin-Perforated	¾″	CCF	38	38	36	45	45	48	53	56	61	66	63	49	12″x12″
	⅝″	CCF	34	37	32	41	42	45	51	57	64	67	65	45	12″x12″
Random-Perf. (7)	⅝″	CCF	39	38	30	42	41	45	51	55	63	68	64	43	12″x12″
AUDITONE* Tile	¾″	IC	26	38	33	35	43	46	50	55	55	62	49	41	12″x24″
Random-Perforated (8, 9)															
Fire-Rated PERFATONE* Units	2 13/16″	IC	26	34	29	29	34	39	45	51	49	47	36	—	12″x24″
Diagonal Perf. (12, 13)															

NOTE: All surfaces tested were painted. Abbreviations, mountings: IC—concealed suspension system, interrupted at partitions; Ad—adhesively attached; IE—exposed suspension system, interrupted at partitions; CE—exposed suspension system, continuous at partitions; CCF—concealed suspension system, continuous at partitions, flat splines; CCT—same as CCF, except with tee splines. Also see Footnotes, below.

FOOTNOTES—SOUND CHARACTERISTICS TABLES, pages 3 and 4

All test results shown are from independent recognized laboratories.

(1) Acoustical ceiling constructions classified by Underwriters' Laboratories, Inc.
No. 4351-1—¾″ ACOUSTONE "90"—Design 6—1½ Hours.
No. 4351-3—¾″ ACOUSTONE "90"—Design 15—1 Hour.

(2) Acoustical ceiling constructions classified by Underwriters' Laboratories, Inc.
No. 4351-4—¾″ ACOUSTONE "120"—Design 41—2 Hours.
No. 4351-7A—¾″ ACOUSTONE "120", and MOTIF'D ACOUSTONE "120"—Design 85—2 Hours.

(3) Irregular in thickness but nominally ¾″.

(4) Tile penetrated with two slots for AIRSON Air Distribution System.

(5) Tile penetrated with five slots for AIRSON Air Distribution System.

(6) Perforated in a random, pin-hole pattern.

(7) Perforated 445 holes per sq. ft., 97 of 3/16″ and 348 of 1/8″ dia.

(8) Perforated 323 holes per sq. ft., 188 of 3/16″ and 135 of ¼″ dia.

(9) Factory painted face and bevels. Also furnished factory painted, with special paint finish giving Class C flame resistance rating.

(10) Perforated 897 holes per sq. ft., 573 of 1/8″ and 324 of 1/16″ dia.

(11) Acoustical ceiling construction classified by Underwriters' Laboratories, Inc.
No. 4739—2 13/16″ Fire-Rated PERFATONE—Design 49—3 Hours.

(12) Perforated 1105 holes per sq. ft. of .093″ dia.

(13) Ceiling tested was continuous at partition.

types and functions

1. ACOUSTONE* Mineral Acoustical Tile

description

The nine standard types of ACOUSTONE are available as shown in the table on page 2. There is a wide choice of patterns both for adhesive and various mechanical applications. U.S.G. manufacturing tolerances produce every tile to closely controlled dimensions. All types have been tested in accordance with AMA I-II attenuation and ASTM CM-23 absorption procedures. Sound absorption and attenuation data appear in tables on pages 3 and 4.

function

Fire and Sound Ratings—See USG Construction Selector, Section B, and USG Folders b-1547, b-1557, b-1567.

Resistance to Soiling—The smooth, painted finish of ACOUSTONE resists soiling and limits objectionable air travel ("breathing") through face of tile. See ACOUSTONE PC, page 7.

Washability—Factory-painted ACOUSTONE may be washed with a damp sponge or cleaned with a vacuum cleaner, chemical rubber sponge (used dry), or putty or paste type wallpaper cleaner. Accidental spotting or soiling can usually be removed by this method before over-all redecoration is necessary.

Paintability—May be brush or spray painted with non-bridging paints without appreciable loss of sound absorption either at 500 cycles per sec. or in the Noise Reduction Coefficient. The effect of repeated coats of paint on ACOUSTONE "F" and other materials may be found in Research Paper RP-1298 "Effect of Paint on Sound Absorption of Acoustical Materials," obtainable from the National Bureau of Standards. Oil, casein, resin emulsion or spirit thinned paints may be used with recommended painting procedures.

limitations

ACOUSTONE should not be installed until moisture resulting from plastering, concrete or terrazzo work, etc., is no longer a hazard.

ACOUSTONE "F", designed to absorb sound originating within a room, is manufactured by binding mineral fibers into a lightweight, highly sound absorbent tile. The fissured surface closely resembles that of travertine marble. No two tile textures are exactly alike, thus adding interest and avoiding monotony of appearance. Major characteristics include a fire resistance rating of Class A in accordance with Fed. Spec. SS-A-118b, a flame spread rating of 15, and sound transmission class of 29. A standard kerf accommodates splines for both mechanical and adhesive applications.

Specialty ACOUSTONE includes four additional patterns with basically the same physical characteristics as those of ACOUSTONE "F". **Glacier** provides the heavier fissure and rougher surface generally available only in job applied "wet" construction. **Finesse** pattern is a lighter, more subtle fissure than that of ACOUSTONE "F", ideal where a fine texture is desired. **Domino** is an interesting routed version of ACOUSTONE "F"; **Shadow-Line** gives a bold relief effect, particularly adaptable to critical lighting areas with pronounced shadows.

ACOUSTONE db presents the same physical characteristics as ACOUSTONE "F" with a foil backing added for applications where higher sound attenuation, increased insulation value and improved resistance to breathing are desired. It not only absorbs noise, but efficiently retards sound travel through the ceiling and over partitions as well—also eliminates the cost of extra backing. Available with the same **Fissured** surface of ACOUSTONE "F", and in the **Glacier** and **Finesse** textures of Specialty ACOUSTONE.

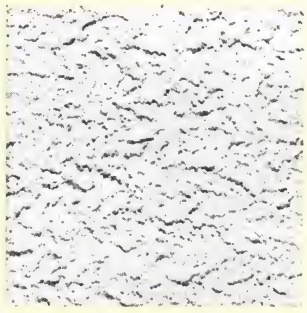
The built-in reflective foil back surface of ACOUSTONE db provides added resistance against winter heat loss—equal to a full inch of gypsum, and even greater resistance to summer heat gain—equal to over an inch of wood fiber roof insulation. The advantage is quickly translated into dollars saved in heating and cooling costs, as indicated by the "R" factors below.

resistance (R) to heat flow†

	ACOUSTONE "db"	regular ¾" mineral tile (without foil)
winter (upward)	4.70	3.59
summer (downward)	11.99	4.28

†1965 ASHRAE Guide (includes tile and air space)

ACOUSTONE "F" and db



Glacier

Finesse

Domino

Shadow-Line

*Reg. U.S. Pat. Off.

Fire-Rated ACOUSTONE* offers the high sound absorption, light reflection and fissured beauty of regular ACOUSTONE Tile, but with additional fire protection of 1, 1½, 2 and 3 hours provided by either the **Fissured** or **Glacier** patterns used in the rated systems described below. Its use eliminates separate expense and construction time for fire protective materials.

ACOUSTONE **90** suspended on the USG Concealed Z-Spline System provides a 1-hour (U/L Design No. 15) rating for wood joist and floor construction, and a 1½-hour (Design No. 6) rating for bar joist and concrete floor (or roof) construction. Foil-backed **ACOUSTONE 120** suspended on the USG Concealed Z-Spline System provides a 2-hour (Design No. 41) rating beneath bar joist and a 2-hour (Design No. 85) beneath beam with concrete floor (or roof) construction. Foil-backed **ACOUSTONE 180** with concealed Z-splines has obtained a 3-hour rating (Design No. 96) beneath bar joist. They also offer the same control of sound transmission across ceiling-height partitions as ACOUSTONE db.

AIRSON ACOUSTONE Mineral Tile is supplied in three types and all 12 ACOUSTONE patterns for use in the AIRSON Ceiling Air Distribution System. This system, still revolutionary despite the millions of square feet now in use, employs adjustable openings in the tile to distribute a wall-to-wall flow of heated or cooled air into a room. Unlike traditional methods of air distribution, the AIRSON System is not dependent upon a costly and complicated system of air supply ducts and diffusers. Instead, it utilizes the plenum area above the ceiling to carry conditioned air to the room through each individual tile. The continuous, uninterrupted beauty of the ceiling is preserved, as all visible "hardware" is eliminated.

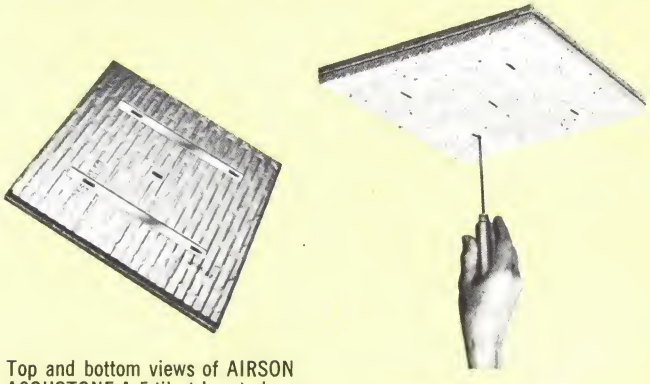
Movable slides on the backs of the tiles (easily adjustable from below) act like small dampers to control the volume of air. Since each tile is individually adjustable, the area can be zoned and balanced for comfort.

The AIRSON ACOUSTONE tile is installed on the USG Concealed Z-Spline System of mechanical suspension—either with all of the tile in the ceiling slotted to provide AIRSON jets, or with a percentage of tile installed without slots.

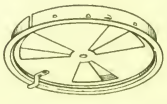
The ACOUSTONE tile used is specially designed for use in the AIRSON System. Its bright, non-breathing, foil back surface prevents seepage of air through the field of the tile and provides reflective insulation in the plenum space. In addition, the tile carries with it all the advantages of high sound absorption, sound attenuation and light reflection.

AIRSON ACOUSTONE tiles offer a choice of two jet arrangements: **A-2,** with two orifices per tile, and **A-5,** with five orifices placed parallel with the fissures of the tile. The A-2 orifice arrangement gives a 35% deeper penetration than A-5 at the same flow conditions, making it more suitable for high ceiling-low flow applications. Both have been proven by test far superior in penetration to ordinary perforated ventilating tile. A third type of tile available is **unslotted.**

In addition to the concealed Z-spline suspension, two AIRSON grid systems are used. These are the steel **AIRFLO T-2 Grid** in which air distribution is accomplished through orifices at 2″ intervals in the face of the tee, and the aluminum **AIRSON LOK Grid** with pairs of orifices spaced 4″ o.c. in the tee. All three systems include complete metal accessories: slides, splines, mouldings, runners, spot jets, clips. Design, erection and specification are covered in USG Folder b-1567.

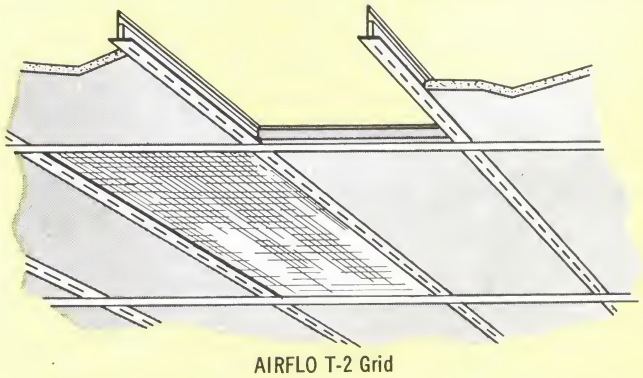


Top and bottom views of AIRSON ACOUSTONE A-5 tile (above) show adjustable slides located on back of unit, and adjustment from face of unit made easily with ordinary ice pick for air flow control.

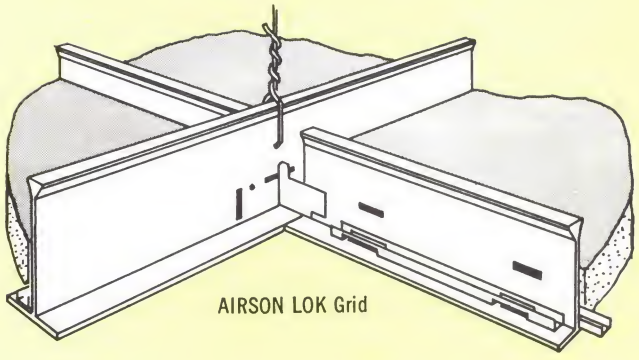


Spot Jet

AIRSON ACOUSTONE A-2 Tile



AIRFLO T-2 Grid



AIRSON LOK Grid

*Reg. U.S. Pat. Off.

MOTIF'D*ACOUSTONE* tile gives the ultimate in luxurious, never-monotonous appearance. It is produced by altering ACOUSTONE "F" by a patented U.S.G. process that permanently etches a bas relief pattern into the surface. The pattern selected is accented by the varying shadows caused by directional influence of the source of light rather than by differences in applied color. Now offered in seven striking patterns (right), MOTIF'D ACOUSTONE can provide up to 93% sound absorption, 71% light reflectance. All patterns are also available on special order in ACOUSTONE db, ACOUSTONE 120, standard AIRSON*, and AIRSON 120 Tile. Custom patterns can be produced to meet individual requirements.

Odd Module ACOUSTONE in special sizes is available on special order for all types listed above except MOTIF'D ACOUSTONE and Rated ACOUSTONE. Details are required on any size, edge or fissure direction changes requested.

ACOUSTONE PC is supplied with a factory-applied plastic surface coating, ideal for reducing maintenance in ceilings where high soiling is anticipated. The durable soft-luster surface has 20 times the washability of regular acoustical finishes; otherwise, tile characteristics remain unchanged. All ACOUSTONE types and patterns listed above are available with this plastic coating.

ACOUSTONE Space Units can be arranged in variety of patterns to enhance interior decor.

ACOUSTONE Space Units are the ingenious new answer to the problem of annoying sound reverberation within rooms. They are handsome design plaques that *absorb noise on all six surfaces*, thus offer a third dimension in sound control. They complement speech communication—the real criterion in sound conditioning. Used on either walls or ceilings, they serve as primary acoustical material or as economical supplements in areas where it is impractical to install acoustical material throughout a room.

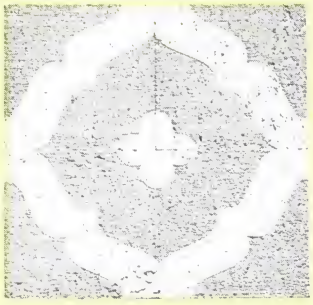
Because of their simplicity, ACOUSTONE Space Units allow limitless decorator treatments and design flexibility. They are 2″ thick, 12″x12″ in size, available in the **Striated, Finesse** and **Glacier** patterns of Specialty and MOTIF'D ACOUSTONE; require virtually no maintenance. Mounting is quickly done by a special clip furnished with each unit. For layout suggestions, absorption and installation data, ask your U.S.G. representative for Space Unit File SC-503.

Absorption of ACOUSTONE Space Units

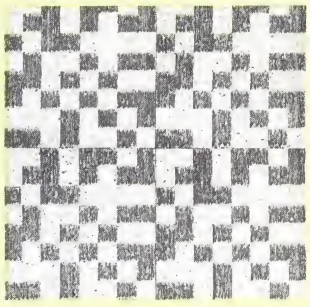
(Sabins per unit)

pattern arrangement	frequency (cps)						
	125	250	500	1000	2000	4000	avg.
16″ patch	0.45	0.97	1.57	1.79	1.70	1.68	1.51
24″ patch	0.53	0.93	1.59	1.94	1.93	1.87	1.60
32″ patch	0.42	0.91	1.69	2.12	2.08	2.01	1.70
16″ strip	0.60	1.02	1.56	1.71	1.68	1.68	1.49

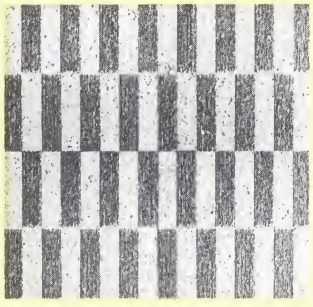
Note: One Sabin is the equivalent of one square foot of material having an absorption coefficient of 1.00.



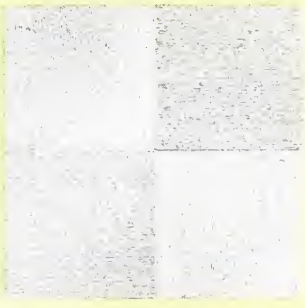
Georgian



Checkmate



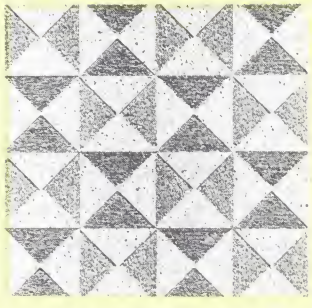
Cadence



Striated

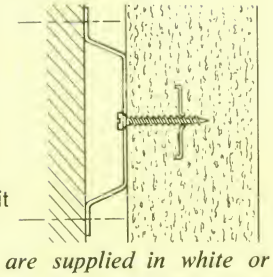
Galaxy

Fantasia



Harlequin

Space Unit—Striated Design



Mounting Clip for Space Unit

Note: All ACOUSTONE products are supplied in white or ivory painted finish. Other pastel colors of TEXOLITE Standard Paint are available on special order.*

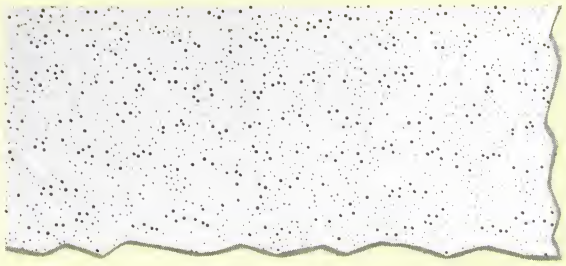
*Reg. U.S. Pat. Off.

2. AURATONE* Noncombustible Panels and Tile

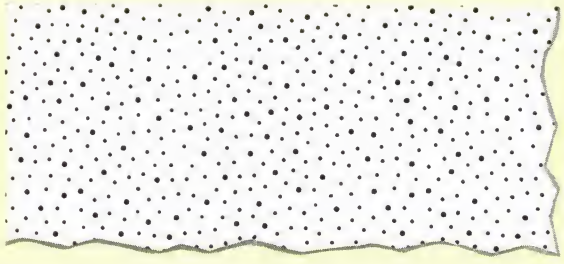
description

AURATONE Noncombustible Acoustical Panels and Tile are the result of a carefully controlled formulation that yields optimum balance between sound attenuation and sound absorption. They are made from prepared mineral fiber by a new process in a plant specially designed for this product.

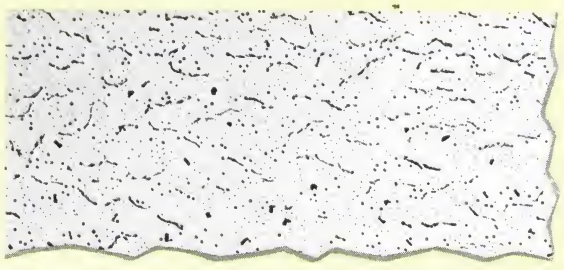
The panels and tile are made in both Regular and FIRECODE* types, (see table, page 2) and in four patterns illustrated below; the tile in ½″, ⅝″ and ¾″ thicknesses, 12″x12″ and 24″x24″ sizes; the lay-in panels in ½″ and ⅝″ thicknesses, 24″x24″ and 24″x48″ sizes. Two patterns—Pin-Perforated and Fissured—also are available for use in the AIRSON* ceiling air distribution system. **AIRSON AURATONE Panels** can be made up for A-2 or A-5 installations (see USG Folders b-1547, b-1567).



Pin-Perforated



Random



Fissured

Snowdrift

function

Fire Resistance—AURATONE products are noncombustible, Class A, rated by the ASTM E84-61T test method. Fire hazard classification: flame spread 25, fuel contributed 25, smoke developed 5. Fire ratings of 1 to 3 hours have been obtained (see USG Folders b-1547, c-1647).

Sound Ratings—The various AURATONE patterns range from .45 to .80 in NRC average, and carry STC ratings of 36 to 49 (see tables, pages 3 and 4).

Economy, Accessibility—They are the recommended choice for any application calling for maximum performance at minimum cost—plus easy access to service lines above the ceiling, through lay-in installation in exposed grids.

Light Reflectance—Rated Class A—see table, page 3.

limitations

1. During installation, temperatures in working areas must be well above freezing.

2. Material must be protected from roof leakage, wetting, etc.

3. AUDITONE* Wood Fiber Acoustical Tile

description

Lightweight AUDITONE Wood Fiber Acoustical Tile is the popular choice where economical ceiling treatment is desired without a requirement for fire resistance. Made in ½″, 9/16″ and ¾″ thicknesses and four sizes ranging from 12″x12″ to 24″x48″ (see table, page 2), AUDITONE Tile is designed for application either by adhesive, nailing or stapling to furring strips, or with metal suspension systems.

Three AUDITONE patterns are available in ½″ and ¾″ thicknesses: **Perforated,** with 529 holes of 3/16″ dia. psf; **Random Perforated,** with 323 holes of 3/16″ and ¼″ dia. psf; **Pin-Perforated,** with more than 1,000 perforations psf. In addition, a **Fissured** pattern simulating travertine marble is offered in 9/16″ thickness.

function

Sound Ratings—AUDITONE patterns range from .50 to .75 in NRC average, and carry STC rating of 41 (see tables, pages 3 and 4).

Maintenance—AUDITONE can be repeatedly brush or spray painted following recommended paint procedures with oil, resin emulsion casein, or any commercial type of paint without appreciable loss of sound absorption at 500 cycles per sec. or in the N.R.C. It can be cleaned with putty or paste type wallpaper cleaners.

Resistance to Soiling—The smooth white painted factory finish of AUDITONE tile resists soiling. AUDITONE with T&G edges minimizes objectionable air travel through the joints when used on suspended nailing strips.

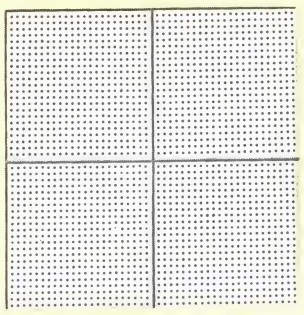
Thermal Conductivity—has a "k" factor of 0.38.

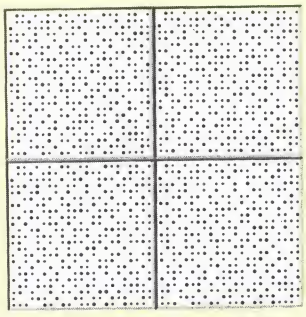
Fire Resistance—Pin-Perforated, Perforated, and Random-Perforated AUDITONE, when painted with a standard USG mill finish, are rated "Class D" by Fed. Spec. SS-A-118b and Interim Fed. Spec. SS-A-00118c; with special paint, Pin-Perf and Random-Perf patterns qualify as Class C; Fissured AUDITONE meets Class C requirements of Fed. Spec. SS-A-118b.

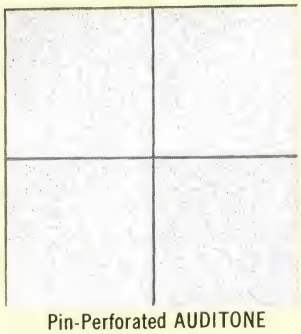
Light Reflectance—Rated Class A, 75% to 82%.

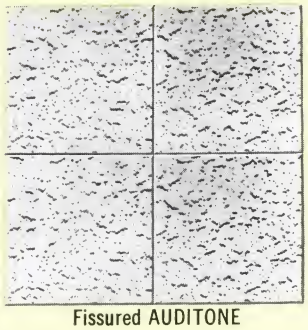
limitations—See General Limitations, page 1.

*Reg. U.S. Pat. Off.


Perforated AUDITONE


Random-Perforated AUDITONE


Pin-Perforated AUDITONE


Fissured AUDITONE

4. PERFATONE* Acoustical Units

description

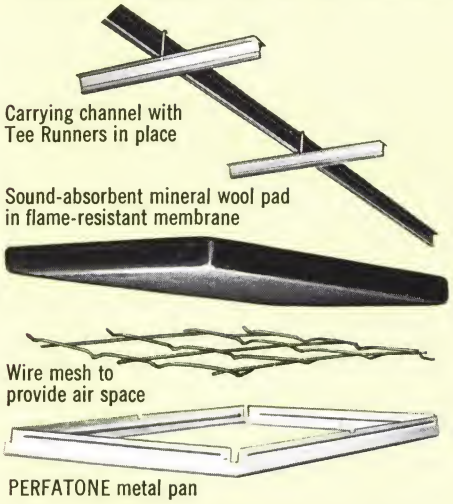
PERFATONE Acoustical Units are perforated metal pans, 12″x12″, 12″x24″ or 12″x36″ in size, scored to simulate 12″x12″ units. Enclosed within the metal units are special mineral fiber sound-absorbent pads, supported on formed wire mesh which provides an air space between the pad and the metal facing. The system makes possible geometrically perfect installation—a fine finished ceiling appearance which other materials cannot duplicate. The mineral fiber pads retain heated or cooled air in the room while controlling sound.

PERFATONE units are available in 26 ga. cold rolled or electrozinc coated steel, or .025″ aluminum. The selection of enamel coatings includes two coats on face side only, or with an additional coat on back side, and a clear alumalite coating in aluminum. Assemblies available include:

—Conventional PERFATONE System, with three styles in face patterns—**Random**, 5/32″ to 13/64″ hole dia.; **Diagonal**, 3/32″ or 7/64″ hole dia.; and **Regular**, 1/8″ hole dia.

—Fire-rated PERFATONE Systems, providing ratings of up to 3 hours, with two face pattern styles—**Random** and **Diagonal** perforated. Special high density mineral fiber pads are used.

The PERFATONE units are also available **Unperforated** for use as border tile or for decorative effects. For other characteristics, see table on page 2.



PERFATONE Assembly Unit

function

Fire Protection—Use of Fire-rated PERFATONE systems eliminates need for contact fireproofing and/or intermediate ceiling fire barriers in many installations; Conventional PERFATONE system rated Incombustible by AMA.

Sound Ratings—Excellent absorption and attenuation; see tables, pages 3 and 4.

Maintenance—Provides quick access to any plenum area; easily maintained and highly washable.

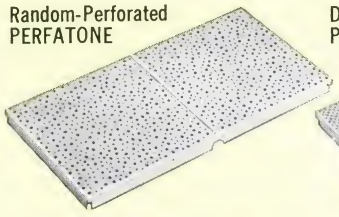
Decoration—Has 72% light reflectance in white; can be painted in decorator colors with high-grade metallic paint without impairing acoustical properties, if care is taken not to fill perforations.

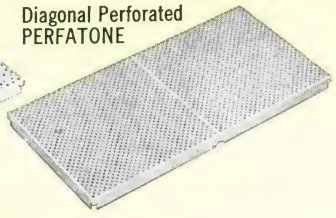
limitations

In areas of high humidity or where moisture might impinge against the acoustical surface, Aluminum PERFATONE Acoustical Units with galvanized fittings should be used, or a different architectural design should be considered.

Ratings and other information on the PERFATONE system are covered in USG brochures SC-505 and SC-508.

PERFATONE Accessories, in addition to pans and mineral fiber pads, include more than 50 elements which make up the various systems available—broadest in the industry. A single specification assures the use of parts made to fit and function together—tee runners, wire grids, straps, clips, clamps, spacers, wall moulding, angles, channels, grid pad supports.


Random-Perforated PERFATONE

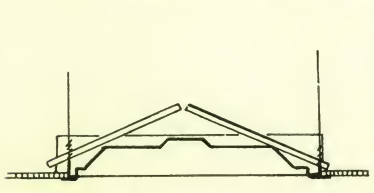

Diagonal Perforated PERFATONE

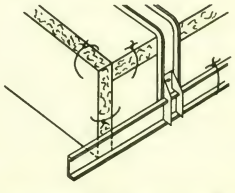

Regular Perforated PERFATONE


Unperforated PERFATONE

THERMAFIBER Rated Light Fixture Protection brings packaged convenience to jobs using USG ceiling systems, whether panel or tile. This consists of 1¼″ thick semi-rigid mineral wool board wire-tied and suspended over fixtures. The assembly (illustrated, below) carries U/L Labels covering board module ceiling designs of 1, 1½, 2 and 3 hours for which ratings have been established. It is adaptable to acoustical tile

THERMAFIBER* Insulation Light Fixture Protection


with exposed grid


with concealed Z-spline suspension

*Reg. U.S. Pat. Off.

and panel ceiling constructions using either an exposed grid or concealed Z-spline suspension.

The THERMAFIBER package is shipped in modules for two constructions using acoustical ceiling board, and one where tile is used.

5. USG Ceiling Boards

description

Two ceiling board products are available from U.S.G. for specialized applications.

—**SHEETROCK* Ceiling Board,** non-acoustical, for lay-in panel use in ceiling grid systems. Available in nom. 24″x24″ and 24″x48″ sizes, special sag-resistant gypsum core with either (a) unpainted plain manila face paper, or (b) painted white. Two thicknesses available: ⅜″ and ½″.

—**USG Asbestos Board,** 5/16″ thick in nom. 24″x24″ and 24″x48″ sizes, supplied either Perforated or Unperforated, for lay-in use in ceiling grid systems. Square-edged or beveled (1/16″ bevel on all four sides). Perforations, 0.197 in. dia., are spaced ½″ o.c. White Rippletone texture finish.

Where an incombustible base for adhesive application of ceiling tile is required, USG products available include BAXBORD* and BAXBORD FIRECODE gypsum backing board, SHEETROCK and SHEETROCK FIRECODE gypsum wallboard, ROCKLATH* plaster base. See USG Folders f-1867, f-1877.

For other characteristics, see table on page 2.

6. USG Metal Accessories for Ceilings

description

United States Gypsum markets precision-made metal accessories which contribute to assured performance when its three Z-spline suspension systems are specified:

—Concealed Z-Spline
—Concealed Accessible
—Exposed Z-Spline

U.S.G. also supplies complete accessories for two other systems described in preceding sections of this catalog—the AIRSON* Air Distribution System, and PERFATONE Metal Pan System. Ratings, erection and specification of all assemblies are covered in pertinent USG Systems Folders. For the three spline systems, metal accessories are supplied in five groups as follows:

Basic Grid Parts—1½″ and ¾″ 16 ga. cold rolled channels, 16′ and 20′ lengths; electro-galv. spring spacers, 18 ga. troffer clips, 10 and 11 ga. galv. clips.

Concealed Z-Spline Parts (all 26 ga.)—¾″ and 1¼″ Z-splines, 10′ lengths, and splices; flat splines; 1¼″ finish channels, 10′ lengths, and splices; No. 90 clips, corner plates, touch-up lacquer.

Exposed Z-Spline Parts—26-ga. 1¼″ Z-splines, 10′ lengths, and splices; tee and angle splines.

Concealed Accessible Parts—Angle splines, 23½″ and 10 15/16″ lengths.

12″x12″ Access Tile Parts—Split angles (R or L), 11 5/16″ L-splines.

specifications

notes to architect:

1. United States Gypsum recommended contractors are highly trained specialists in the installation and design of U.S.G. sound control systems. They are well-equipped to survey your job, make recommendations and estimates, and help solve functional and esthetic problems that may be encountered. Should the problem be beyond the scope of a U.S.G. contractor, he will recommend a competent acoustical consultant who may advise you.

2. U.S.G. sound control contractors will usually arrange for their own layouts and detailing for jobs. Architects may, however, prefer to furnish their own layouts.

I. scope—List all areas to receive acoustical treatment.

II. general provisions—Bases to receive acoustical units and the units themselves shall not be installed unless satisfactory closures for windows and other openings are in place and roofs are tight. Temperatures in the working areas shall be well above freezing.

Bases to receive acoustical units shall be sound, dry, and free of moisture.

The area or room in which acoustical units are to be installed shall not be damp; i.e. plaster, terrazzo floor, etc. shall be previously installed and dry.

The recommendations for construction conditions found in the latest Acoustical Materials Association Bulletin shall apply.

III. materials—Acoustical products by the United States Gypsum Company shall be (specify sizes, edges, patterns, installation from table, page 2):

a. ACOUSTONE Mineral Acoustical Tile

—ACOUSTONE "F" (white or ivory)

—ACOUSTONE Glacier, Finesse, Domino or MOTIF'D ACOUSTONE

(1) *Adhesive application:* Adhesive of the type manufactured expressly for the purpose of applying acoustical tile (IV below).
(2) *Metal Suspension:* The Concealed Z-spline suspension system as supplied by the United States Gypsum Company.

—ACOUSTONE Shadow Line
Metal suspension accessories by the United States Gypsum Company shall be:

(a) 8 ga. galv. hanger wires
(b) 1½″ cold rolled channels
(c) #82-A clip (ceiling attachment direct to 1½″ channel)
(d) #85 clip (ceiling attachment to bar joist)
(e) #90 clip (ceiling attachment to wood furring)
(f) ACOUSTONE finish channel
(g) Spring steel spacer
(h) 1¼″ Z-Spline
(i) 24-ga. galv. T-Spline

—ACOUSTONE db

—ACOUSTONE 90, 120 or 180
Metal suspension accessories by the United States Gypsum Company shall be: (a) (b) (c) (f) and (g) above, plus following:

(j) ¾″ Z-spline
(k) 26 ga. galv. steel flat spline

*Reg. U.S. Pat. Off.

—AIRSON* ACOUSTONE (See USG Folder b-1567)

—ACOUSTONE PC (Specify basic tile from above)

—ACOUSTONE Space Units

b. AURATONE* Noncombustible Acoustical Panels and Tile
(Type) (size) (pattern) (*specify from page 2*)
Materials by others shall be (specify manufacturer) exposed grid system. This grid will be installed in accordance with manufacturer's instructions (see USG Folder b-1547).

—AIRSON AURATONE (See USG Folder b-1567)

c. AUDITONE* Wood Fiber Acoustical Tile

—Perforated AUDITONE

(1) *Mechanical Suspension*
(a) T&G Runners, closed type
(b) 1½″ c.r. carrying channel grillage
(c) Nos. 82, 85 & 90 Clips

(2) *Staples, Nails and Screws*
(a) Staples for (½″ or ¾″) T&G AUDITONE—9/16″ long, coated
(b) Nails for (½″ or ¾″) T&G AUDITONE—(1⅛″) (1¼″) blue lath type
(c) Screws for ½″ T&G AUDITONE—⅞″ No. 4 flat head; for ¾″ T&G AUDITONE—1″ No. 4 flat head

—Fissured AUDITONE

(1) *Staples* for (9/16″ or ¾″) T&G Fissured AUDITONE—9/16″ long, coated

(2) *Nails* for (9/16″ or ¾″) T&G Fissured AUDITONE—(1⅛″) (1¼″) blue lath type

(3) *Adhesive*—see IV below

(4) *USG T&G Runners*
(a) Open type for attachment to wood furring with USG #90 Clip
(b) Closed type for attachment to 1½″ c.r. channel grillage

(5) *USG E-Z-S Metal Suspension System* (for ¾″x12″x23¾″ Fissured AUDITONE, bevel edge, kerfed and rabbetted)

(6) *Exposed Metal Grid* (selected by architect) for Fissured AUDITONE "lay in" panels

d. Bases for tile and panel application

(1) 1½″ *c.r. carrying channel* and 10 ga. hanger wire

(2) *Gypsum board over nailing channel:*

—Nailing channel and splice plate

—17 ga. galv. tie wire

—1¼″ nails, 12½ to 11 ga.. with ring shank 16 to 20 rings per inch, medium or short diamond point, ¼″ to 5/16″ head.

—Bases: ½″ SHEETROCK* FIRECODE* wallboard; ½″ or ⅝″ BAXBORD* backing board; ⅝″ BAXBORD FIRECODE backing board

—Butt joint clip or butt joint washer

(3) *Wood Grillage:*

—1″x3″, 2″x2″ or 2″x3″ wood nailing strips—straight grain, kiln dried and free from knots

e. PERFATONE Acoustical Units

(1) PERFATONE (conventional or fire-rated) metal pan acoustical units; sound-absorbent mineral wool pads to fit
(2) 8 ga. galv. hanger wires
(3) 1½″ c.r. carrying channels
(4) Tee Runners (conv. or fire-rated)
(5) Tee Runner wire clips
(6) PERFATONE finish channel
(7) Tee Runner splice plate, integrity clip, hold-down clips, nailable Tee Runner clip, Tee Runner rod suspension clip, Tee Runner intersection clip, access panel kit, strap-hanger, as required.

All of the above except 8 ga. galv. hanger wires furnished by United States Gypsum.

f. THERMAFIBER Rated Light Fixture Protection

(1) 1¼″ thick THERMAFIBER mineral wool board
(2) Standard tie-wire (not furnished by United States Gypsum)

g. SHEETROCK Ceiling Board

h. USG Asbestos Board

IV. adhesive application

a. Adhesive shall be of a type manufactured expressly for the purpose of applying acoustical tile and shall not be water soluble. It shall not contain ingredients that react chemically with paint, or contain a solvent that has a stronger solvent action on an oil paint than naphtha.

b. 12″x12″ ACOUSTONE units shall be primed with adhesive prior to the application of 4 spots of adhesive placed near the corners of the tile. The adhesive shall be approximately 2½″ in dia. after the tile has been pressed into position on the ceiling.
Place ¾″x3″x.048″ fiber splines in the kerfs at the corners of the acoustical units (required only for square edge ACOUSTONE* and MOTIF'D ACOUSTONE*).

c. ½″x12″x24″ T&G AUDITONE* shall be primed with adhesive prior to the application of 6 spots of adhesive. Place 4 spots of adhesive near the corners of the 12″x24″ units and 2 spots near the edges of the tile at the centerline of the 24″ dimension. The adhesive shall be approximately 2½″ in dia. after the tile has been pressed into position on the ceiling. The units shall be placed so that the face surface of the acoustical ceiling is aligned and level.

d. Adhesive application to plaster and concrete

Notes to architect:

—Size of units—tile should not exceed 12″x12″ for ceilings or 12″x24″ for walls.

—New lime putty finish may have free lime on the surface which can cause saponification of oils and resins in the adhesive. For this finish a combination of adhesive and nailing is recommended.

—Hard oil (sometimes called gloss oil) when used as a size for calcimine may react with the solvents of the adhesive and therefore is an unsatisfactory base. In this case, a combination of nailing and adhesives must be used. The acoustical contractor can determine by job testing when to augment the adhesive with nailing.

—The use of ROCKLATH* plaster base without plaster is not recommended where job conditions, particularly moisture conditions, are unsuitable. Accordingly, ACOUSTONE mineral acoustical tile should be applied to such a base only when the installation of the base is made under the supervision of and to the satisfaction of the USG acoustical contractor.

—Unless it is possible to determine the moisture condition of a concrete surface, the adhesive application of any acoustical tile to a concrete slab is not recommended. (For a more economical and secure method of attaching ACOUSTONE to concrete slabs, consider use of Z-spline and wood furring, 2-a below).

—The adhesive application of ACOUSTONE directly to wood strips or plywood is not recommended.

(1) *On new work:* base shall be a full thickness of rodded brown coat of gypsum plaster in a clean, dry, level state.

(2) *On existing work:*

(a) Old lime putty finish shall be acceptable as a base if it has been in place for a year or more and if the finish is well bonded

to the basecoat of plaster. If it is not well bonded, apply Z-splines attached to wood furring strips with No. 90 Clips.

(b) A good quality paint well bonded to sound plaster and in place not less than 6 months shall be an acceptable base.

V. installation of metal grillage and gypsum board

a. 1½″ c.r. channel grillage—10 ga. hanger wires shall be securely attached at 4′-0″ o.c. 1½″ carrying channels shall be tied to the hanger wires and shall be hung level at a maximum spacing of 4′-0″ o.c. The 1½″ channel adjacent to an intersecting wall shall not be placed more than 12″ from the wall.

b. Gypsum board and nailing channel—Nailing channel shall be securely wire tied to 1½″ cold rolled carrying channels with 18 ga. galv. tie wire.

Nailing channel maximum spacing shall be:

(1) 24″ o.c. for ½″ and ⅝″ gypsum boards having either "V" edges or taped joints.
(2) 16″ o.c. for ½″ BAXBORD* backing board.
(3) 20″ o.c. for other ½″ or ⅝″ gypsum boards.

Nail spacing shall be 6″ c. to c. End joints are to be staggered at least one support spacing. Butt joints shall occur at the nailing channel where butt joint clips or washers shall be used 6″ o.c.

VI. installation of wood grillage—Main members (2″x2″ or 2″x3″) shall be suspended not more than 36″ o.c. 1″x3″ furring strips shall be nailed in place not more than 12″ o.c. (For nail, staple or screw method of applying ¾″x12″x24″ T&G AUDITONE, the furring strips may be placed 16″ o.c.)

VII. application of tile to base

a. By adhesive—see IV above.

b. 12″x24″ T&G AUDITONE shall be installed by attaching the leading tongue edge at the ends and center with the specified staples (nails or screws):

(1) To the wood furring or wood framing
(2) To the gypsum board base (screw application only)

VIII. other suspension systems—for data and specifications covering use of USG sound control products with other methods of suspension, see USG Systems Folders: b-1547, AURATONE Suspension Systems; b-1557, ACOUSTONE Suspension Systems; b-1567, AIRSON* systems; b-1506, QUIETONE metal grid system.

IX. installation—ACOUSTONE Space Units

ACOUSTONE Space Units (Striated) (Finesse) (Glacier) pattern shall be applied to wall or ceiling as designated on Chart ( ), by the following means:

a. Mechanical—Hat section of USG incombustible mounting device shall be secured to (wall) (ceiling) no closer than 15″ from another hat section or 9″ from any obstruction, with two (nails, screws, molly or toggle fasteners, case hardened furring nails, concrete nails, Shure-Set by Ramset). Space Unit shall be positioned so that pre-punched hole on back face engages machine screw on hat section, and shall be securely engaged. All units shall be removable for decoration without damaging applied surface.

b. By adhesive—Four 1-cu. in. daubs of (Acousti-Gum, Acousti-Bond, Penco Super Shur-Stick) adhesive shall be applied about 3″ from corners on back side of each Space Unit. Application shall follow adhesive manufacturer's directions. Units shall be pressed firmly into place. (Note: adhesive application deters later decoration.)

USG® Asphalt Roofing Products

f

1937

A.I.A. File No. 12-B/12-B-2

description and utility

Exterior protection of buildings has been a United States Gypsum specialty ever since the company began manufacturing roofing products, in 1933. USG asphalt roofing offers the protection of rated fire resistance plus the two other characteristics most important to architects—beauty, expressed in harmonious, lasting colors, and durability, promising minimum maintenance for years to come.

Value and dependability are built into these products through the unique USG quality control standards. Asphalt shingles, for example, are made from top-grade felt that is asphalt-saturated to resist aging and coated with a special stabilized asphalt. Color-fast granules are embedded in the heavy-bodied coating to form a weather-protective shield. A second coating covers the back of the shingle—all carefully controlled to conform to rigid specifications. These manufacturing safeguards are backed by regular testing and constant product improvement at the USG Research Center, largest and best equipped in the industry.

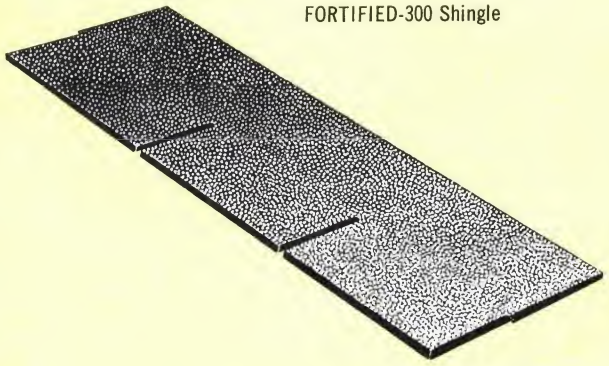
The wide diversity of types, styles and colors makes it possible to satisfy almost every asphalt roofing requirement. U.S.G. offers differing product lines, tailored to market preferences, in three large geographic areas:

Northeast (states north and east of North Carolina, West Virginia and Ohio)—3-tab asphalt shingles, both conventional and self-sealing, in 300-lb., 265-lb. and 235-240-lb. weights; also 2-tab, 300-lb. triple coverage asphalt shingles.

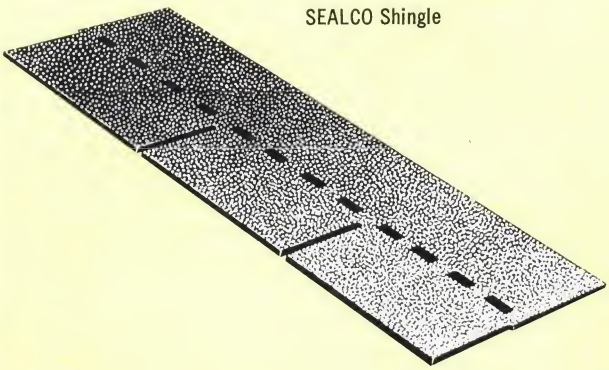
Upper Midwest (Iowa, Minnesota, North Dakota, South Dakota, Nebraska, Wisconsin, northern Illinois, northern Michigan, eastern Montana)—3-tab asphalt shingles in 300-lb., 265-lb. and 235-lb. weights and self-sealing type; also double coverage interlocking shingles.

West (California, Oregon, Washington, Idaho, Utah, Nevada, Arizona, western Montana, Hawaii)—20, 15 and 10-year bonded built-up roof assemblies; 3-tab asphalt shingles in 300-lb. and 235-lb. weights and self-sealing type.

USG asphalt roofing is *made to work together*, economically and compatibly, with other USG exterior materials—poured gypsum concrete roof decks, precast gypsum roof plank, wood fiberboard roof insulation, and wood fiberboard insulating roof deck (West only). The benefit of dealing with a single manufacturer is extended further by incorporating into the job such additional USG exterior products as gypsum or insulating sheathing, exterior stucco, mineral siding, mason's lime, aluminum louvers, and paint products.



FORTIFIED-300 Shingle



SEALCO Shingle

types and functions

FORTIFIED-300 Strip Shingles—one of the finest custom shingles ever made—ideal for churches, institutions, public buildings as well as custom-built homes. Almost 30% heavier than standard strip shingles, designed to give maximum rugged wear wherever supreme roof quality is desired.

This fire-resistant 300-lb. shingle is built from extra-heavy felt, given a super-thick asphalt coating and a deep layer of selected granules. The result is a rich, massive appearance with deep shadow lines created by the shingle's extra thickness. FORTIFIED-300 offers long-run economy because of its built-in durability to resist high winds, sun, rain and snow. Available in popular blended colors, textures and standard surfaces; also with the SEALCO self-sealing feature (below) in some areas.

SEALCO Self-Sealing Strip Shingles—wherever the requirement is for maximum wind protection or for application to low-pitched roofs, SEALCO self-sealing shingles offer many advantages over ordinary shingles. SEALCO comes with 12 spots of high-strength adhesive placed across each shingle, automatically bonding the tabs to the nailed-down portion of the previous course. This self-sealing action takes place at normal roof temperatures, not limited to extremes of summer heat. SEALCO carries the U.L. Wind-Resistant label.

The placement of SEALCO sealant spots at intervals across the shingle helps the roof to breathe, and prevents trapping of condensation beneath the tabs. Unlike ordinary shingles, no hand sealing is needed on the lower pitches down to 2/12.

Rugged, fire-resistant SEALCO shingles are available in a wide range of beautiful solid and blended colors.

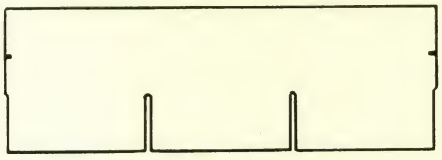
USG 235-lb. Square Butt Strip Shingles—the all-time favorite in roofing shingles of standard weight and design, offering superior

A.I.A. File No. 12-B/12-B-2

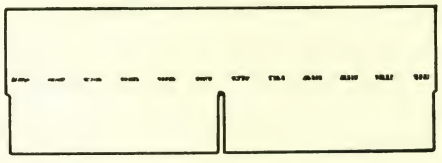
quality at economical cost. These classic 12″ three-tab shingles blend well with both traditional and contemporary styles of architecture, harmonizing with the texture and tone of exterior walls.

Square Butts (identified as CASCADE Shingles in West) are available in the widest range of rich-toned colors of any USG shingle—in solid, blended and pastel shades. Rock-hard mineral granules give them a lasting full-color brilliance.

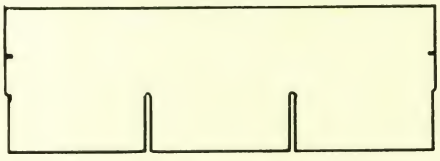
For the extra protection and longer life of a triple-coverage roof, USG Square Butts may be applied with a 4-in. exposure in place of the standard 5-in. exposure—done by using built-in alignment guides and increasing quantity by 25%.



2-Tab SEALCO Strip Shingles (available in Northeast only)—huge 18″ tabs. 50% wider than in 3-tab roofing, accentuate horizontal roof lines desired in contemporary design. SEALCO self-sealing features provide maximum wind protection, permit use on low-pitched roofs. Carries U.L. Wind-Resistant label.



USG Giant Strip Shingles (available in Northeast and Upper Midwest)—265-lb. super-thick shingles for custom appearance and long service. Conventional three-tab design, in range of solid, blended and pastel colors; also available with the SEALCO self-sealing feature in some areas.



Specialty Shingles, available in areas of market demand, include lock shingles for high-wind areas—double coverage and standard GRIP-LOCK, standard-weight IMPERIAL-LOCK, and lighter weight ARRO-LOCK shingles. Others are 10″ THATCH and STARCRAFT shingles for distinctive appearance, individual DUTCH LAP and ANGLE LAP shingles, and Hexagon shingles for re-roofing and utility needs.

Asphalt shingle application

USG Asphalt Shingle Roofing—Specifications

product	availability: North-east	Upper Mid-west	West	approx. weight per sq.	dimension (in.)	shingles sq.	exposure (in.)	headlap (in.)	Underwriters' label
FORTIFIED-300	X	X	X	300 lbs.	12 x 36	80	5	2	C
2-Tab SEALCO	X			235-240 lbs.	12 x 36	80	5	2	wind-resistant
Giant Strip	X	X		265 lbs.	12 x 36	80	5	2	C
SEALCO	X	X	X	235-240 lbs.	12 x 36	80	5	2	wind-resistant
235-lb. Square Butt (CASCADE in West)	X	X	X	235 lbs.	12 x 36	80	5	2	C

Underwriters' Label Service—the Underwriters' Class C label on asphalt roofing products identifies them as being "effective against light fire exposure"; that is, they are "not readily flammable and do not readily carry or communicate fire; afford a measurable degree of fire protection to the roof deck; do not slip from position; and possess no flying brand hazard."

Asphalt shingles bearing the Class C label have been manufactured to conform to Underwriters' Laboratories, Inc., Standard UL 55B Class "C" Asphalt Organic-Felt Sheet Roofing and Shingles, dated April 1962. Shingles bearing the UL Wind-Resistant label have been manufactured with factory-applied adhesive or integral locking tabs to meet a similar UL 1962 standard.

In addition to testing materials for fire resistance, Underwriters' Laboratories maintains a check on labeled products by factory inspections at varying intervals.

USG Built-Up Roofing (available in West only) comprises a full line of products for use on pitched, curved or level inclines over all common roof decks. U.S.G. also provides specifications and application standards for two classes of roof assemblies incorporating these products:

—**Certified Roofs,** for which U.S.G. furnishes inspection service and issues a Certificate of Compliance.

—**Bonded Roofs,** for which U.S.G. provides inspection service and issues a 10, 15 or 20-year surety bond paid for by the owner.

The table following lists the recommended USG built-up roof assemblies available in the Western region—a wide choice of gravel surfaced, mineral surfaced and asphalt-coated asbestos roof coverings. USG products used include various grades and types of asphalt felt, asbestos felt, mineral-surface and smooth-surface roll roofing, roofing asphalt, roof coatings and cements, and wood fiberboard USG Roof Insulation. For complete data and specifications, see the USG Built-Up Roofing Manual, form no. RF-34.

Built-up roofing application

USG Built-Up Roof Assemblies—Western Region Only

USG assembly number	years bondable	U.L. roof covering class	roof slope limits	description of assembly	weight (4) in lbs./sq. ft.	
					nailable decks	non-nailable decks
gravel surfaced roofs						
dl-a-1	20	A	0″ to ½″	3 layers specification roofing; gravel surfacing	6.30	6.40
dl-b-1	20	A	0″ to ½″	5 layers no. 15 asphalt felt (1); gravel surfacing	6.10	6.05
dg-a-1	20	A	0″ to 1″	3 layers specification roofing; double gravel surfacing	7.90	8.00
dg-b-1	20	A	0″ to 1″	5 layers no. 15 asphalt felt (1); double gravel surfacing	7.70	7.65
g-a-1	20	A	½″ to 3″	3 layers specification roofing; gravel surfacing	6.30	6.40
g-a-2	20	A	½″ to 3″	5 layers no. 15 asphalt felt (1); gravel surfacing	6.10	6.05
dl-c-1	15	A	0″ to ½″	1 layer specification roofing; 2 layers no. 15 asphalt felt; gravel surfacing	5.80	5.90
dl-d-1	15	A (2)	0″ to ½″	4 layers no. 15 asphalt felt (1); gravel surfacing	5.70	5.65
g-b-1	15	A	½″ to 3″	1 layer specification roofing; 2 layers no. 15 asphalt felt; gravel surfacing	5.80	5.90
g-c-1	15	A (2)	½″ to 3″	4 layers no. 15 asphalt felt (1); gravel surfacing	5.70	5.65
dg-d-1	10	A (2)	0″ to 1″	3 layers no. 15 asphalt felt; double gravel surfacing	7.15	7.25
g-d-1	10	A (2)	½″ to 3″	3 layers no. 15 asphalt felt; gravel surfacing	5.55	5.65
mineral surfaced roofs						
m-a-1	20	A (3)	½″ to 6″	2 layers no. 15 asbestos felt; mineral surfaced asbestos felt FORTI-CAP sheet	1.60	1.70
m-a-2	15	—	½″ to 6″	2 layers no. 15 asphalt felt; mineral surfaced asbestos felt FORTI-CAP sheet	1.60	1.70
m-c-1	10	C	1″ to 6″	3 layers no. 15 asphalt felt; 1 layer no. 90 ADAMANT cap	2.10	2.20
m-b-1	10	C	1″ to 6″	2 layers no. 15 asphalt felt; 1 layer no. 105 BARRIER cap	1.85	1.95
ss-b-1	10	C	1″ to 6″	1 layer no. 30 asphalt felt; 2 layers SEL-VI-LAP roofing	1.96	2.06
m-c-2	10	C	2″ to 6″	2 layers no. 15 asphalt felt; 1 layer no. 90 ADAMANT cap	1.70	1.80
smooth surfaced asbestos felt roofs						
a-a-1	20	B	½″ to 6″	1 layer no. 45 asbestos base sheet; 3 layers no. 15 asbestos felt (1); protective coating	1.85	1.55
a-b-1	15	B	½″ to 6″	1 layer no. 45 asbestos base sheet; 2 layers no. 15 asbestos felt; protective coating	1.45	1.55
membrane waterproofing (for concrete decks under concrete floors, asphalt concrete paving and promenade tile)						
mw-e-1	—	—	—	3 layers specification sheet; 1 layer reinforcing fabric; 1 layer ADAMANT cap sheet		3.23
tile underlayment						
tu-e-1	—	—	3″ to 6″	2 layers specification roofing	1.05	1.15

(1) Omit one layer no. 15 felt over non-nailable decks. (2) Rating changes to Underwriters' Class B when applied to a wood deck. (3) Additional layer no. 45 asbestos base sheet required for this rating. (4) Weights shown are nominal.

specifications

I. scope—The roofing contractor shall provide labor, materials and equipment necessary for proper installation of asphalt roofing as specified herein, in accordance with application directions furnished by the manufacturer.

II. roof deck inspection—Before starting work, the roofing contractor shall examine thoroughly all roof deck areas on which roofing materials are to be applied. The contractor shall report to the architect or owner's agent in writing any defects which he considers detrimental to the proper application of roofing materials so that defects can be remedied before the roofing materials are applied.

III. materials

a. Asphalt Shingle Roofing shall be: (weight) (FORTIFIED-300) (SEALCO) (other) asphalt shingles (color) as manufactured by United States Gypsum Company (specify from page 2).

b. Asphalt Built-Up Roofing shall be: (select appropriate specification from USG Built-Up Roofing Manual) as manufactured by United States Gypsum Company.

c. Nails shall be: galvanized roofing nails (10 to 12 ga.) with ⅜″ diam. heads. (Specify length from table following.)

Recommended Nail Length—Wood Decks

purpose	nail length
Roll roofing on new deck	1″
Strip or individual shingles—new deck	1¼″
Reroofing over old asphalt roofing	1½″
Reroofing over old wood shingles	1¾″

IV. installation

a. Asphalt Shingles, underlayment, flashings and all other accessories shall be applied in accordance with United States Gypsum directions as printed on shingle wrappers.

Note to architect: Fasteners for non-wood deck materials—when gypsum products, concrete plank and tile, fiber board, or similar materials other than wood are used for the roof deck, special fasteners and/or details for fastening are required to provide adequate anchorage for the roofing. In such cases it is recommended that the specifications of the manufacturer of the deck materials be followed in order to insure his responsibility for its performance.

b. Asphalt Built-Up Roofing (select appropriate specifications from USG Built-Up Roofing Manual).

U.S.G. SALES OFFICES: **ALABAMA:** Birmingham, 871-6136 • **ARIZONA:** Phoenix, 274-5461 • **CALIFORNIA:** Fresno, 233-1102; Los Angeles, 338-1171; Los Angeles (So. Calif.), 665-5721; San Leandro, 569-3020; Sacramento, 443-1989; San Diego, 295-5191 • **COLORADO:** Denver, 388-6301 • **CONNECTICUT:** Hamden, 288-1607 • **FLORIDA:** Jacksonville, 359-1628; North Miami, 754-4553 • **GEORGIA:** Atlanta, 231-3180 • **ILLINOIS:** Chicago, 321-5861; Peoria, 682-5478 • **INDIANA:** Indianapolis, LI 6-4775 • **KENTUCKY:** Louisville, 895-9478 • **LOUISIANA:** New Orleans, 822-0482 • **MARYLAND:** Baltimore, DR 7-8001 • **MASSACHUSETTS:** Cambridge, 491-6318 • **MICHIGAN:** Southfield, 357-2000; Grand Rapids, 456-8611 • **MINNESOTA:** Minneapolis, WA 7-9911 • **MISSOURI:** Kansas City, WE 1-1388; Clayton, PA 1-1133 • **NEBRASKA:** Omaha, 551-6166 • **NEW JERSEY:** Clifton, 472-3900 • **NEW MEXICO:** Albuquerque, 268-2457 • **NEW YORK:** Albany, IV 9-2559; Buffalo, 854-3427; De Witt, 446-1291; Hempstead, 485-9233; New York, 935-4460 • **NORTH CAROLINA:** Charlotte, 332-5023; Raleigh, 828-5441 • **OHIO:** Cincinnati, 961-4300; Cleveland Heights, 321-4141; Columbus, 486-5981 • **OKLAHOMA:** Oklahoma City, JA 5-6645 • **OREGON:** Portland, 227-2518 • **PENNSYLVANIA:** Harrisburg, 234-3251; Bryn Mawr, LA 5-7630; Pittsburgh, 561-4600 • **TENNESSEE:** Memphis, 324-3796; Nashville, 254-1928 • **TEXAS:** Dallas, FL 1-5386; Houston, JA 4-7448; San Antonio, TA 4-4534 • **UTAH:** Salt Lake City, 359-3751 • **VIRGINIA:** Arlington, 525-3301; Richmond, 359-4008 • **WASHINGTON:** Seattle, 633-0745; Spokane, MA 4-3311 • **WISCONSIN:** Milwaukee, BR 6-5672.

USG® Limes for Masonry Mortar

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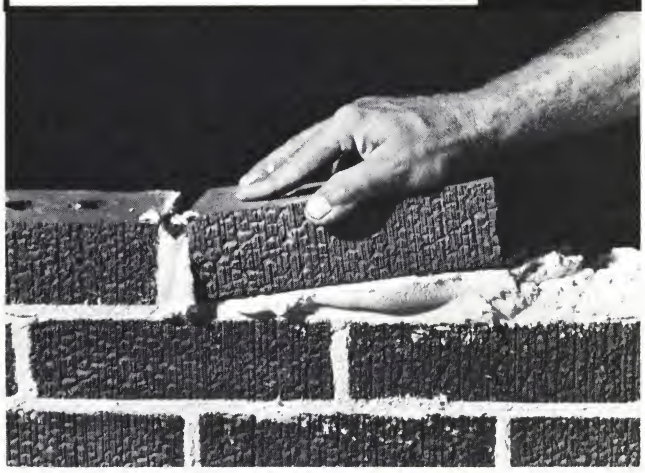


A.I.A. File No. 3-C

description and utility

Lime is universally recognized as the ingredient most essential in producing a good masonry mortar. When properly combined with sand and portland cement, it creates a lime mortar of superior performance and almost ageless durability.

Because of its high plasticity and ability to retain water, lime mortar provides excellent spread and flow under light pressure of the trowel—workability characteristics that assure full uniform mortar joints. The cohesive qualities of lime mortars produce superior bond strength. Lime's unique healing properties are at work constantly, causing mortar and masonry unit to become tenaciously bound together, reducing moisture penetration and helping to prevent efflorescence, leaky walls and frost damage.

United States Gypsum is one of the largest hydrated lime manufacturers and produces four different mason's lime products for versatile and economical mortars, capable of satisfying the most exacting requirements. Following are their chief advantages over the prepared masonry cement types of mortars:

High Plasticity—highly plastic limes impart smooth working qualities to masonry mortar, resulting in more complete filling of joints, more intimate contact and better "keying" between mortar and masonry units.

High Water Retentivity—the lime content of masonry mortar increases water retentivity, which means better mortar bond as well as less retempering of mortar during use.

Strong and Complete Bond—reduces the possibility of leaky walls and efflorescence.

Adequate Strength—U.S.G. mason's limes possess sufficient compressive and tensile strength to insure structural integrity of the wall, without being so strong that they become rigid and brittle. Refer to Technical Data, page 3, for ASTM specifications and typical mortar performance using USG mason's limes.

Elasticity—mortars using U.S.G. lime show far greater elasticity than brittle mortars that are excessively strong and hard. Thus, they exhibit superior crack resistance when walls are deflected by lateral wind pressures.

Weather Resistance—the above characteristics insure tight mortar joints which prevent penetration of water. In addition, high-lime mortars undergo a chemical reaction which allows them to "re-knit" or automatically heal small cracks that may develop between the mortar and the masonry unit. Wetting and drying cycles accelerate the gain in strength which continues for a period of years.

Economy—mortars using U.S.G. lime reduce initial costs because of their high volume, excellent sand-carrying capacity, rapid and neat workmanship, and minimum waste. They also need little maintenance and thus provide long-range economy.

Harsh mortar is conducive to poor workmanship and unfilled joints.

Good mortar encourages good workmanship and well-filled joints.

types and functions

1. Air Entraining MORTASEAL Mason's Lime

description

This new MORTASEAL product is a pressure-hydrated dolomitic mason's lime so formulated that it entrains (traps) air in the mortar when mixed with portland cement and sand. This significant improvement is brought about by a manufacturing process that permits a controlled volume of minute air bubbles to mix with the mortar.

This entrained air goes completely through the mix, and takes the water with it. The result is a mortar that is deeply penetrating and easy to handle, contributing to better masonry construction at lower cost.

Air Entraining MORTASEAL complies with ASTM Specification C-207 Type S, and with Federal Specification SS-L-351 Type M, including the added requirement of not more than 8% unhydrated oxides. It is supplied in a special 3-ply white 50-lb. bag, available in straight or mixed shipments from the U.S.G. Genoa, Ohio plant.

function

Although specifications governing mortar mixing and proportions are the same as for Regular MORTASEAL Mason's Lime, these improved characteristics are available with Air Entraining MORTASEAL:

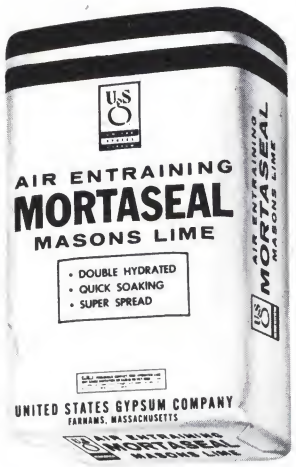
Better Workability and spread promote good workmanship and increased production—15 minutes from bag to board.

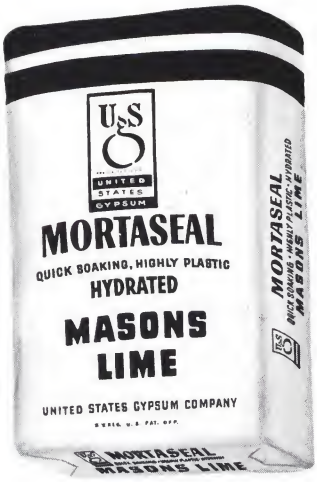
Less Re-Tempering on the job is necessary, due to the material's extended working life. "Shake-up" is needed only once

A high-plasticity mortar made with U.S.G. lime flows with light pressure and encourages good workmanship.

A.I.A. File No. 3-C

*Reg. U.S. Pat. Off.





an hour—not two or three times. This makes a mortar particularly suited for hot weather construction.

Longer-Lasting Bond results from deeper penetration of this more fluid mortar. Air Entraining MORTASEAL absorbs vibration and stress without cracking.

Lower Costs—requires no slaking or soaking; resists suction, even from dry concrete products, permitting ample time for striking joints; thus speeds work and reduces costs. Where specifications permit, an increased volume of sand (approx. ½ cu. ft.) may be carried without sacrificing workability. In high-rise structures, contractors using Air Entraining MORTASEAL have produced further economies by pumping the mortar to points as high as 185 ft.—a difficult task with other mixes.

2. Regular MORTASEAL Mason's Lime

description

This double hydrated product is the standard of the industry among mason's limes designed for mixing with portland cement, sand and water. As manufactured at the U.S.G. Genoa, Ohio plant, it is a dolomitic lime requiring no soaking; as produced at the U.S.G. Farnams, Mass. plant, it is an immediate-soak high calcium lime.

Regular MORTASEAL Mason's Lime meets the following specifications: ASTM C-207 Type S, Federal SS-L-351 Type M, including the added requirement of not more than 8% unhydrated oxides; National Lime Association Type S. It is supplied in 50-lb. bags.

function

Plasticity—MORTASEAL develops exceptional plasticity and workability immediately upon mixing with water—either by machine or by hand. This permits a mortar of excellent working qualities conducive to good workmanship and water-resistant joints.

Water Retentivity—mortar mixes of 1:2½:9 with MORTASEAL lime, as shown in data table, produce the unusually high "flow after suction" (water retentivity) of 93%. They exhibit superior working qualities regardless of high or uneven suction; thus provide a more complete, strong, uniform bond with masonry units. The need for retempering is minimized.

Low Volume Change—because of the 92% hydration of MORTASEAL, volume change due to unhydrated material is negligible. Average putty yield is 40 to 50 cu. ft. per ton.

Strength, Economy—a 1:2½:9 mix of portland cement, MORTASEAL and sand complies with ASTM strength requirements for Type N mortar, yet is one of the lowest-cost mortars. It permits high sand-carrying capacity with consequent maximum mortar yield.

In addition to its use in masonry mortar, MORTASEAL strengthens exterior stucco when used as an ingredient in the basecoat; contributes water resistance to the back-up basecoat for ceramic tile.

3. RED TOP Mason's Hydrated Lime

description

This normal hydrated lime, either dolomitic or high calcium, imparts smooth working qualities to portland cement-lime and sand mortar by increasing its plasticity and water-retention properties. To develop full plasticity and complete hydration, however, it is necessary to soak this type of lime overnight.

RED TOP Mason's Lime complies with ASTM specification C-207 Type N, Federal Specification SS-L-351 Type M, and National Lime Association specification Type N. Supplied in 50-lb. bags.

function

Plasticity—properly soaked Mason's Hydrated Lime has a sufficiently high plasticity to provide excellent working characteristics in masonry mortar.

Water Retentivity—"Flow After Suction" with a 1:1¼:6 and 1:2½:9 mix exceeds 70%, the minimum ASTM requirement, which gives the mortar excellent bonding qualities to adequately resist high or uneven suction in the masonry units. This lime provides adequate strength with low volume change; average putty yield is 45 to 50 cu. ft. per ton.

limitations

1. Must be soaked at least 16 hours to develop a satisfactory plasticity and the required degree of hydration.

4. RED TOP Mason's Quicklime

description

Manufactured in pulverized form, this is a quicklime of uniform quality, high putty yield, and excellent plasticity. It substantially improves the working qualities and sand-carrying capacity of masonry mortars. Quicklimes, however, should be slaked at least 16 hours and properly cooled before using. Under certain job conditions, additional slaking time will improve plasticity.

RED TOP Mason's Quicklime complies with ASTM specifica-

tion C-5 and Federal Specification SS-Q-351. It is supplied in 80-lb. and 100-lb. waterproof bags.

function

Properly slaked and aged, RED TOP Mason's Quicklime develops into a putty of adequate strength and low volume change. Other features:

Plasticity—generally, this product in a mortar exhibits the highest plasticity and easiest working qualities of any type of mason's lime.

Water Retentivity—a 1:2½:9 mix shows "flow after suction" of 89%.

High Yield—produces over 50% more putty volume than hydrated limes.

limitations

1. For best results, quicklime must be of recent manufacture to avoid air slaking in container.

2. Must be handled carefully to avoid burning.

3. Must be properly slaked and aged at least 16 hours, or until the putty cools to 80° F.

specifications

notes to architect

a. The provisions following are offered as desirable inclusions in any masonry specification, but are not necessarily intended as a complete section covering masonry specifications.

b. Generally, masons figure a 94-lb. bag of portland cement and a bag of hydrated lime as each equalling one cu. ft., and would add 6 cu. ft. of sand to make a 1-1-6 mix. Actually a bag of hydrated lime is equivalent to about 1¼ cu. ft.

I. general provisions—All masonry materials shall be protected from freezing so that they will remain above 35° F. until they have been placed and suitably protected.

Masonry shall be protected against freezing for at least 48 hours after placing. Unless such precautions against freezing are taken, no masonry shall be erected when temperature is below 32° F. on a rising temperature, or below 40° F. on a falling temperature. No masonry shall be laid on walls or footings that are frozen or contain frost.

II. mortar materials

a. Lime shall be:
(Air Entraining MORTASEAL Mason's Lime)
(Regular MORTASEAL Mason's Lime)
(RED TOP Mason's Hydrated Lime)
(RED TOP Mason's Quicklime)
—as manufactured by the United States Gypsum Company.

b. Portland Cement shall comply with ASTM C-150, Type I, II or III.

c. Sand shall comply with ASTM C-144.

d. Water used in mixing shall be clean and free of deleterious amounts of acids, alkalies, or organic materials.

III. mortar preparation—(Air Entraining MORTASEAL, as furnished in original containers, shall be machine mixed with other

(*specifications continued on page 4*)

technical data

ASTM C-270 Specifications

physical properties			proportions by volume		
mortar type	min. avg. comp. strength —psi 28 days	water retention % min.	portland cement (1)	lime (2)	sand (3)
M	2500	70	1	¼	2.8 to 3¾
S	1800	70	1	¼ to ½	2.8 to 4½
N	750	70	1	½ to 1¼	3.4 to 6¾
O	350	70	1	1¼ to 2½	5.1 to 10½
K	75	70	1	2½ to 4	7.9 to 15

NOTES: (1) Portland Cement—To comply with ASTM C150, Type I, II, or III; or ASTM C175, Type IA, IIA, or IIIA. (2) Lime—To comply with ASTM C5 (Quicklime) or ASTM C207 (Hydrated) Type N or S. (3) Sand Aggregate—To comply with ASTM C144.

Average Test Results
Air Entraining MORTASEAL Mason's Lime

mortar type	job proportions (1) by volume	comp. strength psi 28 days	water retention—% (2)	entrained air—% (3)
N	1:1¼:6	1800	89	8
O	1:2½:9	850	95	8

Notes: (1) Portland cement to Air Entraining MORTASEAL Lime to damp loose sand. (2) Based on mortars having an initial flow of 100%. (3) Based on mixes prepared with Portland Cement complying with ASTM C-150, Type I, II & III only.

Regular MORTASEAL Mason's Lime

mortar type	job proportions by volume	comp. strength— psi 28 days	water retention —%(1)
M	1:¼:3¾	4924	69.0
S	1:½:4½	3154	70.4
N	1:1¼:6	2150	80.6
N	1:1¼:6¾	1750	78.0
O	1:2½:9	916	93.3
O	1:2½:10½	663	78.0
K	1:4:15	203	88.3

Notes: (1) Based on mortars having an initial flow between 100% and 115%. Fineness: 85% min. through #200 mesh.

RED TOP Mason's Hydrated Lime

mortar type	job proportions by volume	comp. strength— psi 28 days	water retention —%(1)
M	1:¼:3¾	4277	62.8
N	1:1¼:6	1953	77.2
O	1:2½:9	853	85.6
K	1:4:15	203	88.3

Notes: (1) Based on mortars having an initial flow between 100% and 115%. Fineness: 85% min. through #200 mesh.

RED TOP Mason's Quicklime

mortar type	job proportions by volume	comp. strength— psi 28 days	water retention —%(1)
M	1:¼:3¾	—	66.7
N	1:1¼:6	1420	87.5
O	1:2½:9	550	89.0
K	1:4:15	—	82.0

Note: (1) Based on mortars having an initial flow between 100% and 115%.

specifications (*continued*)

mortar ingredients, adding only sufficient water to produce desired mortar plasticity.)

(MORTASEAL shall be mixed without soaking or slaking.)

(RED TOP Mason's Hydrated Lime shall be soaked at least 16 hours before using.)

(RED TOP Mason's Quicklime shall be slaked and aged for at least 16 hours, or until the putty temperature is 80° F. or less.)—all preparation shall follow manufacturer's directions.

IV. mortar proportions

a. Above Grade—Mortar made from materials complying with the above specifications shall be mixed in proportion of one bag Portland cement, two bags lime (or two and one-half cubic feet quicklime putty), to not more than ten and one-half cubic feet sand (1:2½:10½).

b. Below Grade—Mortar made from materials complying with these specifications shall be mixed in proportion of one bag Portland cement, one bag lime (or one and one-quarter cubic feet quicklime putty), to not more than six and three-fourths cubic feet of sand (1:1¼:6¾).

c. Specialized Uses—

(1) For extra strength, reduce proportion of sand, or use 1:2½:8 or 1:1¼:5 mix.

(2) For extreme strength or under excessive moisture conditions, use a reduced lime content, or 1:¼:3 mix.

(3) For glass block, use 1:1:4, or 1:1:5 mix.

(4) For power plant chimneys, use 1:2:5 mix.

(5) For ceramic tile, use 1:1:6 mix.

(6) For basecoat in ORIENTAL* Exterior Stucco applications, use MORTASEAL Mason's Lime in 1:2:7½ proportion for scratch coat; apply in full ⅜" coat, cross rake, cure by spraying with water for several days; add 2 lbs. fiber or hair for application over stucco mesh or metal lath. For brown coat, use MORTASEAL in 1:2:9 mix; apply a full ⅜" coat over dampened scratch coat, darby level and leave rough, using broom if necessary; cure by spraying periodically with water for several days. For finish coat, use ORIENTAL Exterior Stucco according to manufacturer's directions (see USG Gypsum Plasters Folder, this series).

V. workmanship

Note to Architect: Detailed workmanship specifications will vary, depending on type of job and building units involved. However, it is suggested that on all masonry work, the following be incorporated.

a. Mortar shall be laid in a uniform bed without furrows, and all joints shall be completely filled. Sufficient mortar shall be placed in mortar beds and in head and collar joints to completely fill all spaces between masonry units.

b. Highly absorbent brick shall be wetted (not soaked) before laying.

c. Mortar materials shall be accurately proportioned and thoroughly mixed. Re-tempering with additional water shall be kept to a minimum. Mortar which has been mixed for more than two hours shall be discarded.

USG® Expanded Metals for Product Design

av 94

A.I.A. File No. 30-J/15-T

For a better way . . . look to USG Expanded Metals

Men who are responsible for the progress of industry today are constantly looking for a better way: to design a new product; to improve on "last year's model"; to make a product safer, more efficient, more salable. One of their major responsibilities is selection of the right materials. USG Expanded Metals, decorative, strong, light in weight, and easy to fabricate, are being selected as precisely the "right" materials for hundreds of products. They are chosen because they perform precise functional roles at costs within strict budgeted limits.

Product designers are finding that USG Expanded Metals offer infinite possibilities in design. Scores of products, such as those listed below, have been improved by the creative application of these multi-purpose metal meshes. This can be accomplished with any product that needs the strength of metal without the weight of solid metal, or can benefit from the beauty of these meshes either as a major part of its design or as ornamentation.

what they are

These materials of 1001 uses are products of a process that slits and expands solid sheets of metal to form continuous, uniform patterns. USG Expanded Metals are lighter in weight, and offer greater resistance to bending, than the solid metal sheets from which they are made. They may be cut without raveling, formed, or welded. They are available in various metals, regular or flattened, in many gauges and sizes and may be divided into six major groups:

1. **Decorative Expanded Metals**—13 patterns
2. **Carbon Steel EXPAND-X***
3. **Aluminum EXPAND-X**
4. **Stainless Steel EXPAND-X**
5. **Flattened EXPAND-X**
6. **GRATE-X* Expanded Metal Grating**—(covered in USG Folder AV-96)

how they serve you better

In USG Expanded Metals, these desirable characteristics are found:

Lightweight—USG Expanded Metals, slit and cold drawn into continuous sheets, weigh about one-third as much as the original solid metal sheets.

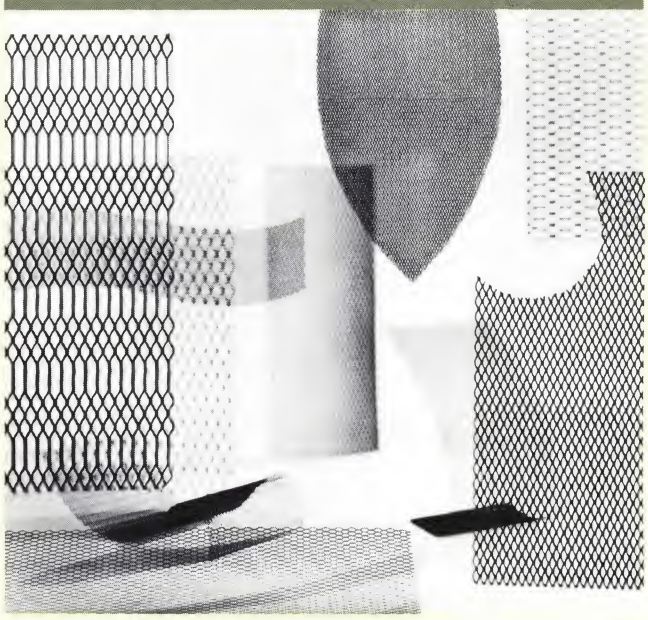
High Strength—The strands and bonds of expanded metal lie at a sharp angle to the original plane of the sheet, adding rigidity—greater resistance to bending.

Easy to Fabricate—USG Expanded Metals are highly adaptable to further fabrication—an important consideration in product designing. They will not ravel. They are easily cut and bent with tools normally used for working sheet metal, and readily welded by all common welding techniques. They are rigid, yet may be formed to many desired shapes.

Easy to Finish—All meshes are receptive to industrial finishing techniques. They can be painted, porcelain-enameled, nickel-plated, chrome-plated, copper-plated, or plastic-coated. Aluminum meshes can be anodized.

Large Open Area—USG Expanded Metals offer a high percentage of open area, which provides free passage of air, heat, light, and sound, or the free flow of liquids. The openings allow dust and dirt to fall through the mesh. Expanded metals also permit proper keying action when used as reinforcing.

Unique Directional Property—The thickness and angle of strands in some of the patterns combine to shield and conceal



in one direction while permitting light, ventilation and visibility in another. The more rugged meshes function as sunshades.

More Sales Appeal—The smart, contemporary patterns and the clean, strong, three-dimensional look of expanded metal lend a newness to any product. At the same time, USG Expanded Metals contribute to the product's over-all strength and durability.

Design Opportunity Unlimited—A variety of patterns and mesh opening sizes makes this material a hard-working "tool" for the designer, as versatile as his own imagination. Any of the decorative meshes, used as a major design element, will set the pace with authority. As a subordinate element, it will blend into any design. Either way, USG Expanded Metals can help you solve tough design problems, with beautiful, useful solutions.

Nationwide Distribution—Whatever your need for expanded metal, a U.S.G. Expanded Metal Distributor is ready to serve you. His warehouse stock, plus fast special ordering, assure you of the prompt service and delivery. Contact the U.S.G. Sales Office for the name of the nearest distributor.

typical uses . . .

- Air Duct Outlets
- Conveyor Guards
- Annealing Baskets
- Grain Driers
- Machine Guards
- Coolers
- Intake Grilles
- Harvesting Baskets
- Display Racks
- Filter Screens
- Tool Stand Shelves
- Drying Trays
- Advertising Displays
- Range Hood Vent
- Lawn Mower Guard
- Dehumidifier Grilles
- Appliances
- Air Conditioner Grille
- Lamps
- Automobile Grille
- Beverage Racks
- Water Fountains
- Cabinet Doors
- Furnace Grilles
- Furniture
- Breakfront Grilles
- Freezer Vent
- TV and Radio Grilles
- Bookshelves
- Screen Door Guards
- Sign Backgrounds
- Heaters
- Fans
- Room Dividers

A.I.A. File No. 30-J/15-T

*Reg. U.S. Pat. Off.

recommendations for use

If an aluminum mesh is attached to a steel frame, a gasket of rubber or other non-conductor should be used to provide insulation and prevent galvanic corrosion. All meshes should be rigidly attached to the framing at approximately 6″ centers. Bending decorative meshes on a very short radius, particularly when repeated, may cause fracturing. Hot-dipped galvanization is not recommended for ARMORWEAVE pattern. Aluminum meshes to be used without finishing should be thoroughly cleaned to eliminate dirt, soot and oils which can accumulate on the surface.

types and functions

1. Decorative Expanded Metals

All decorative patterns of USG Expanded Metals offer countless new design possibilities. These attractive, functional and economical materials are produced from both soft open hearth carbon steel and aluminum alloy 3003-H14 sheets. Where required, these decorative meshes can be specially made from other alloys.

In manufacture, sheets of metal are slit and cold-drawn into continuous mesh patterns. The strands and bonds of the resulting meshes come to rest at a sharp angle to the original sheet. This makes the expanded mesh more rigid than a solid sheet and gives it a three-dimensional effect which adds texture. USG Expanded Metal in this form is called "Type R." For applications where a smooth surface is desired, a flattened form of some patterns is produced by cold-rolling the mesh after expansion. Flattened meshes are designated as "Type F." For detailed specifications on these meshes, refer to Technical Data, page 4.

ARMORWEAVE, a sturdy, massive, handsome mesh pattern, is produced in 5/16″, ½″, 1½″ and 4″ styles to adapt to varying proportion requirements. Its wide-offset strands and bonds give ARMORWEAVE several unique and value properties. Because of them, ARMORWEAVE has excellent concealing power, pleasing depth and texture, and added strength and rigidity. Yet this mesh retains a high percentage of open area for passage of air and usable light. These reasons make ARMORWEAVE an ideal material to use for ventilation panels, grilles in appliances and other consumer goods.

FESTOON, a light, airy mesh pattern with a maximum percentage of open area is also produced in 5/16″, ½″, 1½″ and 4″ styles. Combined with its attractive appearance, these characteristics make it an excellent material for space dividers, decorative grilles, and balcony railings.

LYRIC—suggested by the graceful form of the lyre, offers new opportunity to add distinctive decoration and beauty. Available in 1″ style; produced from aluminum only.

HONEYCOMB—available in 3/32″, ⅛″, 13/64″ styles, from steel or aluminum. Excellent for furniture, grilles or appliances, protective guards. Allows ventilation while its textured surface adds design interest. Bends easily, yet is sturdy enough to hold its shape.

WAVELENGTH—an excellent all-purpose pattern. Like all USG Expanded Metals, WAVELENGTH will not distort, is not environment-sensitive. Available in 3/32″, ⅛″, 3/16″, ½″ styles from steel or aluminum.

MIN-X—a miniature diamond-pattern mesh, produced in five strand widths to give a wide choice of concealing power. Perfect for many grille and ornamental trim applications. Available in 3/16″ style, steel or aluminum.

DISPLAY MESH—available in ¼″ style, steel only. Openings designed to take standard perforated hardboard accessories. Makes an ideal display background with the glamor and good looks of metal.

DEMI—available in 3/32″ style, aluminum only. A fine choice where fashion adds important sales appeal to products. DEMI, as all small-mesh patterns, dramatically reduces restyling costs.

EXPANDETTE—available in ¼″ style, steel only. A medium size mesh that offers great strength for its weight.

MELODY—presents an interesting texture and harmony that designers use to add eye-catching appeal to their products. Available in ¼″ and ½″ style from steel and aluminum.

COUNTERPOINT—departing from the strict symmetry of other designs, this unusual pattern moves gracefully in any environment. Available in ¼″ and ½″ styles, from steel or aluminum.

NAUTILUS—supports long thin lines while providing a louvered effect for good directional flow and excellent concealment. Available in ⅛″ style, from steel or aluminum.

RONDO—available in ½″ style from steel or aluminum. Symmetrical in pattern and therefore more traditional. RONDO blends easily with any formal motif.

CATHEDRAL—its long, thin modern lines may be placed to provide a horizontal or vertical accent. Available in ½″ and 1″ styles.

2. Carbon Steel EXPAND-X Expanded Metal

This is a diamond-shaped product manufactured from soft open hearth steel sheets. The strands and bonds are at a sharp angle to the original plane of the sheet, thus distributing loads in many directions to the supporting structure and improving rigidity and bending resistance.

There are no rivets or welded joints except where units are joined. The material can be readily cut, welded, bent and formed (see Fabricating, page 3).

Carbon Steel EXPAND-X is suitable for a vast number of applications where protection, reinforcement, greater strength with less weight, air flow and lighting are required.

Available in a wide selection of styles: six diamond sizes, six gauges, various sheet sizes depending on style (see page 6 for details). Shipped unpainted and unfinished but lightly oiled to inhibit rusting.

3. Aluminum EXPAND-X Expanded Metal

This product, with diamond shaped openings, is manufactured from aluminum alloy type 3003-H14. While other alloy types may be expandable, 3003-H14 is best suited and provides wide utility, high corrosion resistance, adequate strength, and low cost. Meshes formed from this alloy can be either anodized or porcelain enameled.

Aluminum EXPAND-X has all the advantages of aluminum, plus lighter weight, higher strength, and a clean attractive design which are added in the expanding process. These characteristics permit the use of lighter weight equipment and appliances to ease work in industry and in the home. Aluminum EXPAND-X fabricates easily; can be cut without raveling and is readily formed and welded.

The highly pleasing appearance of Aluminum EXPAND-X—its clean, geometric design, its lasting, corrosion-resisting, satiny finish—suggest a multitude of interior and exterior applications. Food processing and chemical industries, especially, have found many uses for these products.

Available in a wide selection of styles: three diamond-shaped opening sizes, three gauges, and sheet sizes 3′x8′ and 4′x8′ (see page 6 for details). Shipped unbuffed and unpolished.

4. Stainless Steel EXPAND-X Expanded Metal

This has diamond-shaped openings and is manufactured from alloy Type 304, 18-8 (18% chrome, 8% nickel) austenitic stainless sheets. Certain other alloy types of expanded stainless steel can be furnished on request.

Stainless Steel EXPAND-X offers designers a material that combines the properties inherent in stainless steel with the characteristics found in expanded metal. Stainless steel is highly resistant to most types of corrosion and oxidation. This makes it ideal for applications in chemical, oil, textile, food processing, meat packing, dairy and beverage industries.

Available in many styles: three diamond-shaped opening sizes, four gauges and sheet sizes 3′x8′ and 4′x8′ (see page 6 for details). Shipped unbuffed and unpolished.

5. Flattened EXPAND-X Expanded Metal

Is made by passing the diamond-shaped expanded metal between pressure rolls. These flatten the material so that strands and bonds are in the same plane and produce a material suitable for applications where a flat smooth surface is desired. Carbon Steel, Aluminum and Stainless Steel Flattened EXPAND-X are available from stock (see page 6 for details).

Fabricating USG Expanded Metals

USG Expanded Metals have found use in a wide range of products and applications because they may be readily fabricated in the same accustomed ways as sheet metals. They may be cut without raveling, formed easily and welded without difficulty.

Cutting—Shearing to size in various shapes is easily done with a power-driven or lever shear. For types of shearing of rectangular pieces, see page 8. A hole, slit or other opening can be put into expanded metal at almost any location using a punch press and die.

Bending and Forming—All types of expanded metal can be readily bent or formed across the strands using a press brake or punch press and conventional dies. If bent at the bond or if bends are extremely severe, it may be necessary to have material normalized or annealed prior to bending. Such fabrication *must* be indicated on the face of the order so material with proper ductility can be furnished.

Welding—Arc, resistance or brazing methods can be used. The absence of scale on the mesh facilitates welding processes and makes a first class weld possible.

Edging and Framing—For more effective design and fabrication of products using Expanded Metals, the selection of the proper edging is highly important. Since USG Expanded Metals are readily adapted to various edging materials, the designer's choice of edging will usually be governed by the end use of the expanded metal assembly. Shown below is data on various edging materials and how to use them to provide greater flexibility of design, utility, economy and complete safety with USG Expanded Metals.

Finishing USG Expanded Metals

The increasing use of USG Expanded Metals in interior decoration and product design is due in part to its adaptability to metal finishing processes which add appropriate color and extra corrosion resistance to the native attractiveness of the metals. Most finishes suitable for application to the base metals can be applied to their expanded form. Some of the more popular finishes are described below.

All USG Expanded Metals are produced from scale-free metal and thus do not present special problems to finishes. Painting with lacquers, plastics or enamels is best accomplished by standard or electrostatic type spray methods. Plastic finishes have also been applied successfully by dipping and surface cladding prior to expansion.

Plating—All USG Carbon Steel Expanded Metals can be galvanized, usually by hot-dipping, by commercial galvanizers located in all parts of the country. Chrome, nickel, copper and brass plating can be applied to this material because it has a smooth surface and is readily adapted to high-grade finishing. If required, USG Stainless Steel Expanded Metals can be electro-polished.

Anodizing—Extra corrosion resistance and color are easily added to USG Expanded Metals made from aluminum by anodizing the expanded product. Depending upon design requirements, either interior or exterior anodizing in a variety of colors or electro-chemical hard coatings may be applied.

Cleaning—USG Expanded Metal should always be cleaned prior to finishing. Most finishers include this as standard procedure. The carbon steel styles are shipped lightly oiled. A solvent or acid dip, followed by water rinsing, is a common cleaning method.

For smaller projects, the Expanded Metal can be wiped clean with a solvent. The aluminum styles may also have oily surface deposits picked up during sheet rolling by the aluminum producer or from expanding machines. Because of possible dust accumulation, it is advisable to clean aluminum meshes which are used without additional finishing. Washing with a mild soap, detergent or non-etching chemical cleaner (followed by thorough rinsing and drying), or the use of wax base and non-wax base polish cleaners are two methods recommended.

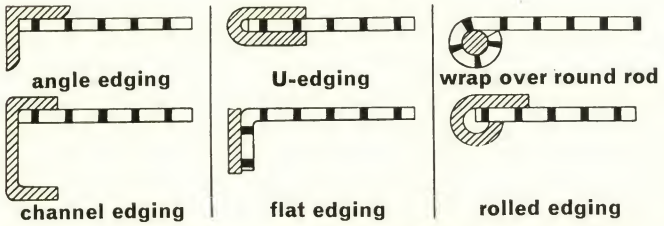
Special Services

Prior to being used in a finished product, some amount of fabricating or finishing is usually performed on USG Expanded Metals. United States Gypsum is prepared to furnish USG Expanded Metals fabricated and finished to specification for direct application and assembly. Or if desired, the user may contract separately for this work.

If the standard products shown on following pages do not meet your exact needs, other patterns—for your exclusive use if desired; other metals—copper, brass, monel, other types of stainless steel; other combinations of gauges and strand widths are available on special order.

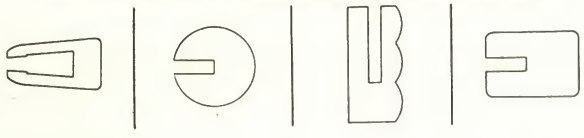
The experience and knowledge of U.S.G. Sales Engineers and distributors are at your service to assist you in planning applications and to answer questions. Contact the U.S.G. Sales Office listed on the back cover or the distributor in your area.

Rigid Edgings



Rigid steel or aluminum edgings are popular for their high strength and ease of fabrication. Hot rolled angles, rounds, bars or channels, and cold rolled U-edging or other specialty extruded sections are also suitable.

Semi-Rigid . . . Extruded Plastic Edgings



Various types of plastics can be used for extruded plastic edgings where light weight, economy and color are needed and strength is not too important.

technical data—Decorative expanded metal

All dimensions and weights are approximate. "a" = SWO (Short Way of the Opening.) "b" = LWO (Long Way of the Opening.) (H) = Heavy Strand (L) = Light Strand

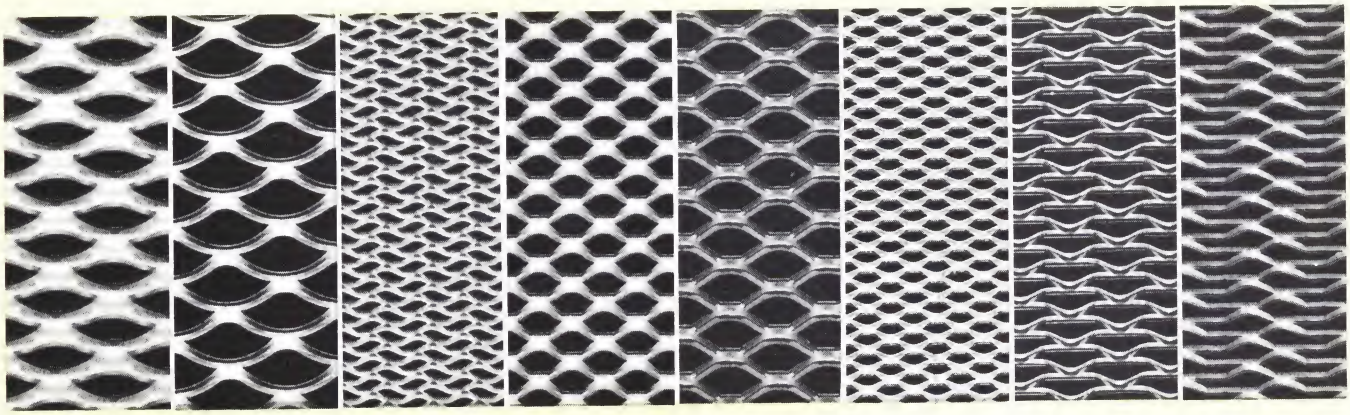
pattern & material	reg. flat.	style designation	design size a x b (inches)	opening size (inches)	strand size c x d (inches)	overall thickness e (inches)	standard sheet size width (SWO)	standard sheet size length (LWO)	per cent open area	wt.—lbs. per 100 sq. ft.
ARMORWEAVE		5/16" #22	.300 x .600	.120 x .430	.030 x .100	.120	4′	4′	40	83
		1/2" #20	.60 x 1.20	.410 x .938	.036 x .200	.219	4′	8′	34	100
		1/2" #18	.60 x 1.20	.375 x .938	.048 x .200	.219	4′	8′	34	133
		1/2" #16	.60 x 1.20	.375 x .938	.060 x .200	.219	4′	8′	34	166
Carbon Steel	R	1 1/2" #20 (L)	1.33 x 3.00	.71 x 2.26	.036 x .500	.500	4′	8′	25	113
		1 1/2" #20 (H)	1.50 x 3.00	.65 x 2.28	.036 x .675	.600	4′	8′	10	135
		1 1/2" #18 (L)	1.37 x 3.00	.70 x 2.26	.048 x .500	.540	See Footnote 1		27	146
		1 1/2" #18 (H)	1.50 x 3.00	.54 x 2.10	.048 x .675	.550	See Footnote 1		10	180
		1 1/2" #16 (L)	1.37 x 3.00	.70 x 2.30	.060 x .500	.570	4′	8′	27	183
		*1 1/2" #16 (H)	1.50 x 3.00	.48 x 2.03	.060 x .675	.550	4′	8′	10	226
		5/16" .040	.300 x .600	.110 x .410	.040 x .100	.133	4′	4′	37	38
		1/2" .051	.60 x 1.20	.375 x .938	.051 x .200	.219	4′	8′	34	48
		1/2" .081	.60 x 1.20	.350 x .938	.081 x .200	.219	4′	8′	34	77
Aluminum	R	1 1/2" .051 (L)	1.24 x 3.00	.520 x 2.10	.051 x .500	.500	See Footnote 2		21	59
		1 1/2" .051 (H)	1.47 x 3.00	.400 x 2.00	.051 x .675	.470	See Footnote 2		10	67
		1 1/2" .081 (L)	1.26 x 3.00	.520 x 2.10	.081 x .500	.530	See Footnote 1		23	91
		1 1/2" .081 (H)	1.46 x 3.00	.430 x 2.00	.081 x .675	.520	See Footnote 1		10	106
FESTOON		5/16" #22	.300 x .600	.200 x .460	.030 x .060	.098	4′	4′	67	50
		1/2" #20	.625 x 1.20	.507 x .938	.036 x .090	.175	4′	8′	71	43
		1/2" #18	.625 x 1.20	.503 x .938	.048 x .090	.175	4′	8′	71	58
	R	*1/2" #16	.625 x 1.20	.500 x .938	.060 x .090	.175	4′	8′	71	72
		1 1/2" #16	1.50 x 3.00	1.375 x 2.625	.060 x .112	.217	4′	8′	85	42
		*1 1/2" #13	1.50 x 3.00	1.313 x 2.625	.089 x .112	.236	4′	8′	81	62
Carbon Steel		*1 1/2" #9	1.50 x 3.00	1.25 x 2.50	.135 x .141	.292	4′	8′	81	115
		1/2" #20	.688 x 1.20	.550 x 1.00	.030 x .100	.030	8′	4′	64	39
		1/2" #18	.688 x 1.20	.545 x 1.00	.040 x .100	.040	8′	4′	64	52
		*1/2" #16	.688 x 1.20	.540 x 1.00	.051 x .100	.051	8′	4′	64	65
	F	1 1/2" #16	1.688 x 3.00	1.438 x 2.625	.052 x .125	.052	8′	4′	79	34
		*1 1/2" #13	1.688 x 3.00	1.438 x 2.625	.071 x .140	.071	8′	4′	81	51
		*1 1/2" #9	1.75 x 3.00	1.25 x 2.50	.110 x .204	.110	8′	4′	75	101
		5/16" .040	.300 x .600	.200 x .450	.040 x .060	.103	4′	4′	67	23
		1/2" .051	.625 x 1.20	.507 x .938	.051 x .090	.175	4′	8′	71	21
	R	1/2" .081	.625 x 1.20	.467 x .938	.081 x .090	.175	4′	8′	71	33
		*1 1/2" .081	1.375 x 3.00	1.25 x 2.625	.081 x .112	.250	4′	8′	83	19
Aluminum		*1 1/2" .125	1.50 x 3.00	1.25 x 2.563	.125 x .141	.250	4′	8′	81	38
		1/2" .051	.688 x 1.20	.550 x 1.00	.043 x .100	.043	8′	4′	64	19
		1/2" .081	.688 x 1 20	.580 x 1.00	.069 x .100	.069	8′	4′	64	30
	F	*1 1/2" .081	1.75 x 3.00	1.375 x 2.625	.065 x .160	.065	8′	4′	74	17
		*1 1/2" .125	1.75 x 3.00	1.375 x 2.563	.100 x .190	.100	8′	4′	70	31
RONDO	R	1/2" #20	.520 x 1.195	.469 x .938	.036 x .089	.163	4′	8′	65	52
		1/2" #18	.520 x 1.195	.453 x .938	.048 x .089	.163	4′	8′	65	71
Carbon Steel		*1/2" #16	.520 x 1.195	.438 x .938	.060 x .089	.163	4′	8′	65	86
	F	1/2" #20	.625 x 1.195	.500 x .938	.030 x .100	.030	8′	4′	59	47
		1/2" #18	.625 x 1.195	.469 x .938	.040 x .100	.040	8′	4′	59	64
		*1/2" #16	.625 x 1.195	.438 x .938	.051 x .100	.051	8′	4′	59	78
	R	1/2" .051	.520 x 1.195	.438 x .938	.051 x .089	.163	4′	8′	65	25
Aluminum		1/2" .081	.520 x 1.195	.408 x .938	.081 x .089	.163	4′	8′	65	40
	F	1/2" .051	.625 x 1.195	.500 x .938	.043 x .100	.043	8′	4′	59	23
		*1/2" .081	.625 x 1.195	.475 x .938	.069 x .100	.069	8′	4′	59	36
WAVELENGTH		*3/16" #26	.200 x .500	.115 x .420	.018 x .050	.077	2′	4′	57	38
		*3/16" #24	.200 x .500	.110 x .400	.024 x .050	.084	2′	4′	55	50
	R	*3/16" #22	.200 x .500	.105 x .380	.030 x .050	.091	2′	4′	53	63
		*1/2" #20	.555 x 1.20	.468 x .938	.036 x .103	.171	4′	8′	63	55
		1/2" #18	.555 x 1.20	.453 x .938	.048 x .103	.171	4′	8′	63	74
Carbon Steel		*1/2" #16	.555 x 1.20	.438 x .938	.060 x .103	.171	4′	8′	63	92
		*3/16" #26	.200 x .522	.095 x .430	.015 x .050	.015	2′	4′	47	36
		*3/16" #24	.200 x .523	.090 x .420	.020 x .055	.020	2′	4′	45	48
	F	*3/16" #22	.200 x .525	.080 x .410	.025 x .060	.025	2′	4′	40	60
		*1/2" #20	.625 x 1.20	.500 x .938	.030 x .112	.030	8′	4′	57	50
		1/2" #18	.625 x 1.20	.438 x .938	.040 x .112	.040	8′	4′	57	67
		*1/2" #16	.625 x 1.20	.375 x .938	.051 x .112	.051	8′	4′	57	83
		*3/32" .020 .025	.104 x .240	.050 x .160	.020 x .025	.050	*	*	47	14
	R	*1/8" .020 .025	.138 x .300	.080 x .230	.020 x .025	.050	*	*	58	10
		1/2" .051	.555 x 1.20	.438 x .938	.050 x .103	.171	4′	8′	63	27
Aluminum		*1/2" .081	.555 x 1.20	.410 x .938	.081 x .103	.171	4′	8′	63	43
	F	1/2" .051	.625 x 1.20	.500 x .938	.043 x .112	.043	8′	4′	57	25
		*1/2" .081	.625 x 1.20	.475 x .938	.068 x .112	.068	8′	4′	57	39
CATHEDRAL			Short / Long	Short / Long						
		1/2" #20	.458 x 1.0 / .458 x 2.0	.344 x .75 / .344 x 1.75	.036 x .089	.175	4′	8′	61	58
	R	1/2" #18	.458 x 1.0 / .458 x 2.0	.344 x .75 / .344 x 1.75	.048 x .089	.175	4′	8′	61	77
		1/2" #16	.458 x 1.0 / .458 x 2.0	.344 x .75 / .344 x 1.75	.060 x .089	.175	4′	8′	61	97
Carbon Steel		1" #16	1.0 x 2.0 / 1.0 x 4.0	.750 x 1.5 / .750 x 3.5	.063 x .200	.343	4′	8′	75	99
		1/2" #20	.534 x 1.0 / .534 x 2.0	.344 x .75 / .344 x 1.75	.033 x .092	.033	8′	4′	58	53
	F	1/2" #18	.540 x 1.0 / .540 x 2.0	.344 x .75 / .344 x 1.75	.044 x .092	.044	8′	4′	58	70
		1/2" #16	.562 x 1.0 / .562 x 2.0	.344 x .75 / .344 x 1.75	.052 x .092	.052	8′	4′	58	89
		1/2" .051	.458 x 1.0 / .458 x 2.0	.344 x .75 / .344 x 1.75	.051 x .089	.175	4′	8′	61	28
	R	1/2" .081	.458 x 1.0 / .458 x 2.0	.344 x .75 / .344 x 1.75	.081 x .089	.175	4′	8′	61	45
		1" .081	1.0 x 2.0 / 1.0 x 4.0	.750 x 1.5 / .750 x 3.5	.081 x .200	.343	4′	8′	75	46
Aluminum		1/2" .051	.562 x 1.0 / .562 x 2.0	.344 x .75 / .344 x 1.75	.046 x .095	.046	8′	4′	58	26
	F	1/2" .081	.562 x 1.0 / .562 x 2.0	.313 x .75 / .313 x 1.75	.068 x .100	.068	8′	4′	58	41

*Produced on special order. Footnote 1—Sheet Sizes are 4′ x 8′, 6′ x 8′, and 6′ x 6′3″ 2—Sheet Sizes are 4′ x 8′, 6′ x 8′, 6′ x 6′3″, and 8′ x 4′

Note regarding positioning: The expanded metal may be rotated 90° or 180° from the positions shown in the photographs below. This will achieve varying effects particularly with styles such as FESTOON, WAVELENGTH and CATHEDRAL, and positioning of the mesh should be indicated on drawings.

pattern & material	reg. flat.	style designation	design size a x b (inches)	opening size (inches)	strand size c x d (inches)	overall thickness e (inches)	standard sheet size width (SWO)	standard sheet size length (LWO)	per cent open area	wt.—lbs. per 100 sq. ft.
MIN-X Carbon Steel	R	3/16" #22 .034	.188 x .500	.130 x .350	.030 x .034	.071	†	†	69	45
		3/16" #22 .050	.200 x .500	.120 x .335	.030 x .050	.088	*	*	60	63
		3/16" #22 .060	.211 x .500	.100 x .330	.030 x .060	.100	*	*	47	71
		3/16" #22 .070	.218 x .500	.080 x .320	.030 x .070	.102	*	*	37	80
		3/16" #22 .080	.222 x .500	.070 x .310	.030 x .080	.104	*	*	32	90
		3/16" #24 .034	.188 x .500	.140 x .355	.024 x .034	.067	*	*	75	36
		3/16" #24 .050	200 x .500	.125 x .345	.024 x .050	.090	*	*	63	50
		3/16" #24 .060	.211 x .500	.115 x .340	.024 x .060	.092	*	*	55	57
		3/16" #24 .070	.218 x .500	.090 x .330	.024 x .070	.096	*	*	41	64
		3/16" #24 .080	.222 x .500	.075 x .320	.024 x .080	.098	*	*	34	72
		3/16" #26 .034	.188 x .500	.150 x .360	.018 x .034	.064	*	*	80	27
		3/16" #26 .050	.200 x .500	.130 x .355	.018 x .050	.075	*	*	65	38
		3/16" #26 .060	.211 x .500	.120 x .350	.018 x .060	.083	*	*	57	43
		3/16" #26 .070	.218 x .500	.100 x .340	.018 x .070	.089	*	*	46	48
		3/16" #26 .080	.222 x .500	.080 x .330	.018 x .080	.092	*	*	36	54
Aluminum	R	3/16" .032 .034	.188 x .500	.140 x 350	.032 x .034	.068	*	*	75	17
		3/16" .032 .050	.200 x .500	.120 x .345	.032 x .050	.094	*	*	60	23
		3/16" .032 .060	.211 x .500	.115 x .340	.032 x .060	.099	*	*	55	26
		3/16" .032 .070	.218 x .500	.090 x .335	.032 x .070	.102	*	*	41	29
		3/16" .032 .080	.222 x .500	.080 x .330	.032 x .080	.107	*	*	36	33
HONEYCOMB Carbon Steel	R	3/32" #26 .040	.110 x .240	.030 x .120	.018 x .040	.053	2′	4′	27	54
		1/8" #24 .040	.140 x .300	.070 x .170	.024 x .040	.068	2′	4′	50	57
		1/8" #26 .040	.140 x .300	.060 x .180	.018 x .040	.065	2′	4′	43	43
		13/64" #20 .050	.200 x .333	.100 x .210	.035 x .050	.080	2′	4′	50	75
		13/64" #22 .050	.200 x .333	.100 x .210	.029 x .050	.078	2′	4′	50	63
		3/8" #18	.421 x .75	.340 x .525	.048 x .055	.110	2′	4′	78	52
Aluminum	R	3/32" .020 .040	.110 x .240	.030 x .120	.020 x .040	.055	2′	4′	27	21
		1/8" .020 .040	.140 x .300	.060 x .180	.020 x .040	.065	2′	4′	43	16
		3/16" .040	.180 x .75	.040 x .325	.040 x .075	.125	2′	4′	22	47
		3/8" .040	.380 x .75	.110 x .400	.040 x .140	.175	2′	4′	29	42
		3/8" .051	.421 x .75	.325 x .525	.051 x .065	.134	2′	4′	75	23
DISPLAY-MESH Steel	R	1/4" #18	.250 x .500	.150 x .320	.048 x .050	.105	4′	4′	60	80
		1/4" #20	.250 x .500	.160 x .350	.036 x .050	.099	4′	4′	64	60
EXPANDETTE Steel*	R	1/4" #20	.250 x .667	.150 x .490	.036 x .070	.120	*	*	46	85
DEMI Aluminum	R	3/32" .020 .025	.090 x .240	.040 x .120	.020 x .025	.043	2′	4′	45	15
MELODY Steel	R	1/4" #22	.229 x .800	.120 x .600	.030 x .060	.100	4′	4′	52	66
		1/2" #22	.444 x 1.20	.270 x .925	.030 x .100	.110	2′	3′	60	57
Aluminum	R	1/4" .032	.229 x .800	.120 x .600	.032 x .060	.090	4′	4′	52	24
		1/2" .051	.444 x 1.20	.270 x .925	.051 x .100	.150	4′	4′	60	33
COUNTERPOINT Steel	R	1/4" #22	.229 x .800	.120 x .600	.030 x .060	.100	4′	4′	52	66
		1/2" #22	.444 x 1.20	.270 x .925	.030 x .100	.110	2′	3′	60	57
Aluminum	R	1/4" .032	.229 x .800	.120 x .600	.032 x .060	.090	4′	4′	52	24
		1/2" .051	.444 x 1.20	.270 x .925	.051 x .100	.150	4′	4′	60	33
NAUTILUS Aluminum	R	1/8" .032	.128 x .545	.060 x .280	.032 x .034	.070	2′	4′	42	24
LYRIC Aluminum	R	1" .125	Short 1 x 1.813 / Long 1 x 3.125	Short .080 x 1.30 / Long .080 x 2.60	.125 x .130	.250	††	††	75	46

*These styles or sheet sizes produced on special order only. †Sheet size: 2′ x 4′, and 3′ x 8′. †† Sheet size: 8′ x 4′ and 4′ x 8′.

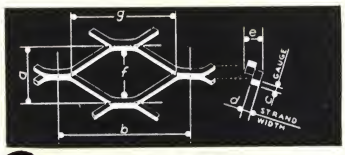


ARMORWEAVE FESTOON WAVELENGTH HONEYCOMB DISPLAY-MESH DEMI MELODY COUNTERPOINT

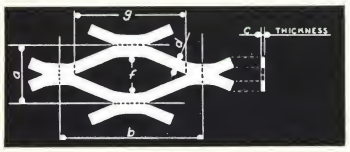
technical data—EXPAND-X expanded metal

styles available	wt. lbs. c sq. ft. black	wt. lbs. c sq. ft. galv.	diamond size a x b inches	opening size f x g inches	strand c x d inches	overall thick-ness e inches	standard sheet size SWD width	standard sheet size LWD length	per cent open area	gauge material used (1)
Carbon Steel EXPAND-X										
¼"—No. 20	86	131	.26 x 1.0	.125 x .687	.036 x .076	.125	4′	8′	40	20
¼"—No. 18	114	159	.26 x 1.0	.125 x .687	.047 x .076	.125	4′	8′	40	18
½"—No. 40	40	60	.497 x 1.195	.406 x .937	.047 x .050	.110	4′	8′	83	18
½"—No. 20	43	59	.459 x 1.195	.375 x .875	.036 x .066	.134	4′	8′	71	20
½"—No. 18	70	84	.507 x 1.195	.375 x .950	.047 x .089	.161	4′ & 6′	8′ & 10′	65	18
½"—No. 16	86	104	.507 x 1.195	.375 x .890	.059 x .089	.159	4′ & 6′	8′ & 10′	65	16
½"—No. 13	147	175	.503 x 1.2	.350 x .900	.089 x .098	.199	4′ & 6′	8′ & 10′	61	13
¾"—No. 34	34	51	.865 x 2.0	.750 x 1.688	.059 x .060	.129	4′	8′	85	16
¾"—No. 16	54	65	.880 x 2.0	.700 x 1.640	.059 x .095	.183	4′ & 6′	8′ & 10′	76	16
¾"—No. 13	80	93	.880 x 2.0	.734 x 1.640	.089 x .095	.185	4′ & 6′	8′ & 10′	76	13
¾"—No. 10	120	133	.889 x 2.0	.675 x 1.563	.089 x .141	.277	4′ & 6′	8′	69	13
¾"—No. 9	180	202	.857 x 2.0	.600 x 1.45	.134 x .137	.290	4′ & 6′	8′ & 10′	68	10
1" —No. 16	47	55	1.01 x 2.375	.875 x 1.937	.059 x .095	.196	4′	8′	82	16
1½"—No. 16	40	47	1.35 x 3.00	1.180 x 2.60	.059 x .112	.210	4′	8′	85	16
1½"—No. 13	60	68	1.35 x 3.00	1.200 x 2.60	.089 x .112	.213	4′, 5′ & 6′	8′ & 10′	85	13
1½"—No. 10	79	87	1.33 x 3.00	1.156 x 2.52	.089 x .140	.248	4′ & 6′	8′ & 10′	81	13
1½"—No. 9	119	129	1.33 x 3.00	1.140 x 2.43	.134 x .141	.289	4′ & 6′	8′ & 10′	76	10
1½"—No. 6	250	273	1.33 x 3.00	1.000 x 2.312	.198 x .203	.410	Note 1		70	6
2" —No. 10	68	77	1.85 x 4.0	1.625 x 3.43	.089 x .164	.296	Special Order		83	13
2" —No. 9	90	102	1.85 x 4.0	1.562 x 3.375	.134 x .149	.296	Special Order		84	10
Carbon Steel Flattened EXPAND-X										
¼"—No. 20	83	125	.26 x 1.03	.088 x .70	.031 x .086	.031	3′ & 4′	8′	34	20
¼"—No. 18	111	159	.26 x 1.03	.088 x .70	.042 x .086	.042	3′ & 4′	8′	34	18
½"—No. 40	39	60	.497 x 1.23	.371 x 1.00	.038 x .063	.038	3′ & 4′	8′	75	18
½"—No. 20	41	42	.438 x 1.25	.313 x .938	.032 x .070	.032	3′ & 4′	8′	64	20
½"—No. 18	66	88	.507 x 1.26	.289 x 1.00	.038 x .109	.038	3′ & 4′	8′ & 10′	58	18
½"—No. 16	82	112	.507 x 1.26	.301 x 1.00	.050 x .103	.050	3′ & 4′	8′ & 10′	60	16
½"—No. 13	138	175	.503 x 1.26	.259 x .97	.070 x .122	.070	3′ & 4′	8′ & 10′	52	13
¾"—No. 34	32	51	.865 x 2.10	.709 x 1.75	.045 x .078	.045	4′	8′	83	16
¾"—No. 16	51	71	.880 x 2.10	.650 x 1.75	.048 x .115	.048	3′ & 4′	8′ & 10′	74	16
¾"—No. 14	64	70	.880 x 2.10	.642 x 1.75	.063 x .119	.063	3′ & 4′	8′	73	14
¾"—No. 13	76	93	.880 x 2.10	.642 x 1.75	.070 x .119	.070	3′ & 4′	8′ & 10′	73	13
¾"—No. 9	171	195	.857 x 2.10	.529 x 1.63	.110 x .164	.110	3′ & 4′	8′ & 10′	62	10
1" —No. 16	45	55	1.01 x 2.50	.780 x 2.06	.048 x .115	.048	3′ & 4′	8′	78	16
1½"—No. 16 (Lt.)	29	40	1.35 x 3.13	1.14 x 2.71	.048 x .103	.048	3′ & 4′	8′	87	16
1½"—No. 16 (Hvy.)	38	44	1.35 x 3.19	1.13 x 2.69	.048 x .123	.048	3′ & 4′	8′	85	16
1½"—No. 14	50	63	1.35 x 3.15	1.07 x 2.68	.063 x .138	.063	3′ & 4′	8′	80	14
1½"—No. 13	57	68	1.35 x 3.15	1.07 x 2.68	.070 x .138	.070	3′ & 4′	8′ & 10′	80	13
1½"—No. 9	113	129	1.35 x 3.25	1.00 x 2.62	.106 x .175	.106	3′ & 4′	8′ & 10′	74	10
Stainless Steel EXPAND-X										
½"—No. 18	73	...	.475 x 1.20	.359 x .906	.050 x .082	.154	3′ & 4′	8′	65	18
½"—No. 16	91	...	.475 x 1.20	.359 x .875	.062 x .082	.161	3′ & 4′	8′	65	16
¾"—No. 18	48	...	.828 x 2.00	.719 x 1.656	.050 x .101	.176	3′ & 4′	8′	77	18
¾"—No. 16	60	...	.828 x 2.00	.672 x 1.656	.062 x .101	.178	3′ & 4′	8′	77	16
¾"—No. 13	91	...	.828 x 2.00	.672 x 1.563	.093 x .101	.192	3′ & 4′	8′	77	13
¾"—No. 9	205	...	.828 x 2.00	.500 x 1.375	.140 x .152	.294	3′ & 4′	8′	65	10
1½"—No. 16	45	...	1.333 x 3.00	1.180 x 2.813	.062 x .115	.296	3′ & 4′	8′	83	16
1½"—No. 13	68	...	1.333 x 3.00	1.156 x 2.640	.093 x .115	.221	3′ & 4′	8′	83	13
1½"—No. 9	137	...	1.333 x 3.00	1.125 x 2.500	.140 x .154	.267	3′ & 4′	8′	77	10
Stainless Steel Flattened EXPAND-X										
½"—No. 18	69	...	.475 x 1.26	.297 x 1.031	.042 x .093	.042	3′ & 4′	8′	61	18
½"—No. 16	86	...	.475 x 1.26	.297 x 1.031	.052 x .093	.052	3′ & 4′	8′	61	16
¾"—No. 18	46	...	.828 x 2.10	.656 x 1.813	.042 x .108	.042	3′ & 4′	8′	74	18
¾"—No. 16	57	...	.828 x 2.10	.672 x 1.813	.052 x .108	.052	3′ & 4′	8′	74	16
¾"—No. 13	88	...	.828 x 2.10	.578 x 1.781	.079 x .108	.079	3′ & 4′	8′	74	13
¾"—No. 9	198	...	.828 x 2.10	.500 x 1.563	.119 x .160	.119	3′ & 4′	8′	61	10
1½"—No. 16	43	...	1.333 x 3.15	1.031 x 2.875	.052 x .124	.052	3′ & 4′	8′	81	16
1½"—No. 13	66	...	1.333 x 3.15	1.016 x 2.525	.079 x .124	.079	3′ & 4′	8′	81	13
1½"—No. 9	131	...	1.333 x 3.15	.906 x 2.658	.119 x .165	.119	3′ & 4′	8′	75	10
Aluminum EXPAND-X										
½"—No. .051	27	...	.507 x 1.195	.375 x .950	.051 x .089	.152	3′ & 4′	8′	65	16
½"—No. .081	41	...	.507 x 1.195	.375 x .890	.081 x .089	.178	3′ & 4′	8′	65	12
¾"—No. .051	17	...	.880 x 2.000	.700 x 1.640	.051 x .104	.192	3′ & 4′	8′	78	16
¾"—No. .081 (Lt.)	32	...	.880 x 2.000	.700 x 1.640	.081 x .122	.211	3′ & 4′	8′	78	12
¾"—No. .081 (Hvy.)	41	...	.880 x 2.000	.734 x 1.640	.081 x .156	.270	3′ & 4′	8′	68	12
¾"—No. .125	65	...	.878 x 2.000	.650 x 1.500	.125 x .160	.320	3′ & 4′	8′	74	8
1½"—No. .081	22	...	1.330 x 3.000	1.200 x 2.563	.081 x .128	.226	3′ & 4′	8′	83	12
1½"—No. .125	43	...	1.330 x 3.000	1.130 x 2.400	.125 x .160	.340	3′ & 4′	8′	85	8
Aluminum Flattened EXPAND-X										
½"—No. .051	25	...	.509 x 1.250	.328 x 1.000	.045 x .091	.045	3′ & 4′	8′	64	16
½"—No. .081	39	...	.525 x 1.271	.297 x 1.000	.067 x .103	.067	3′ & 4′	8′	59	12
¾"—No. .051	16	...	.893 x 2.125	.625 x 1.750	.040 x .114	.040	3′ & 4′	8′	76	16
¾"—No. .081 (Lt.)	30	...	.893 x 2.125	.635 x 1.750	.070 x .134	.070	3′ & 4′	8′	72	12
¾"—No. .081 (Hvy.)	39	...	.893 x 2.125	.547 x 1.750	.070 x .172	.070	3′ & 4′	8′	63	12
¾"—No. .125	61	...	.891 x 2.140	.570 x 1.640	.106 x .180	.106	3′ & 4′	8′	58	8
1½"—No. .081	18	...	1.375 x 3.125	1.094 x 2.625	.055 x .144	.055	3′ & 4′	8′	77	12
1½"—No. .125	40	...	1.313 x 3.150	.950 x 2.500	.106 x .190	.106	3′ & 4′	8′	71	8

(1) U.S. Standard Gauge for steel products; Brown & Sharpe Gauge for aluminum products. All dimensions and weights are approximate.

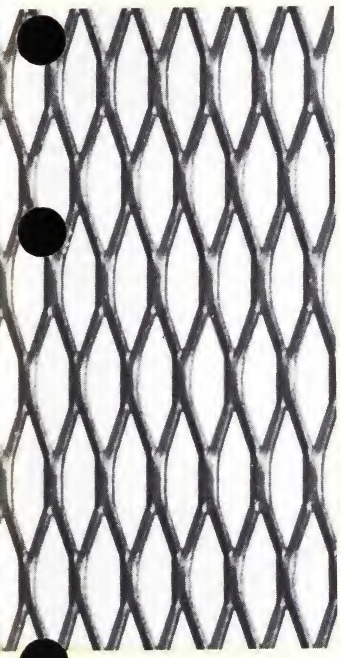


EXPAND-X

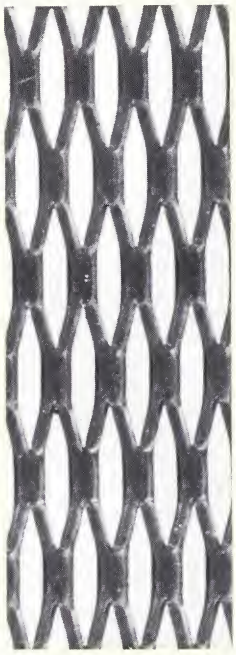


Flattened EXPAND-X

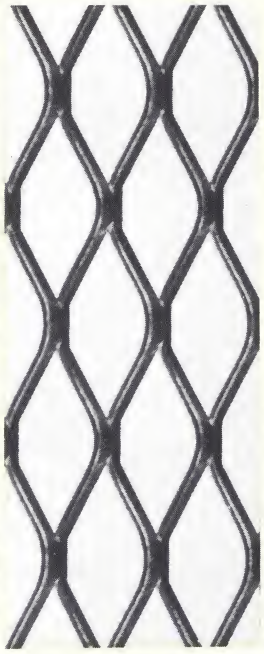
FULL SIZE



¼" No. 20
EXPAND-X

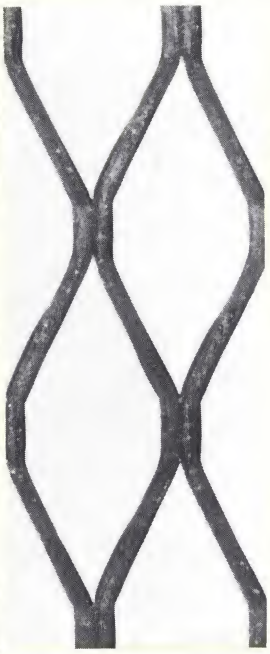


¼" No. 18
FLAT. EXPAND-X



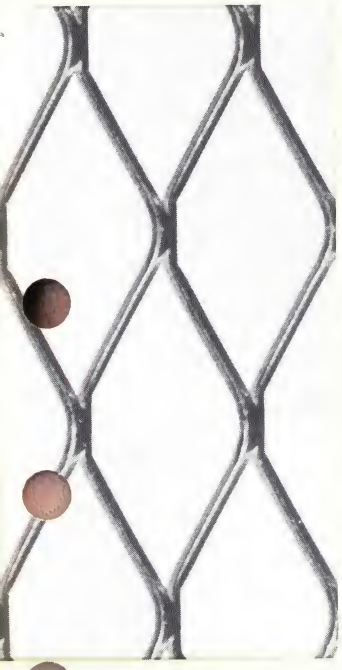
½" No. 18
EXPAND-X

½" No. 13
FLAT. EXPAND-X

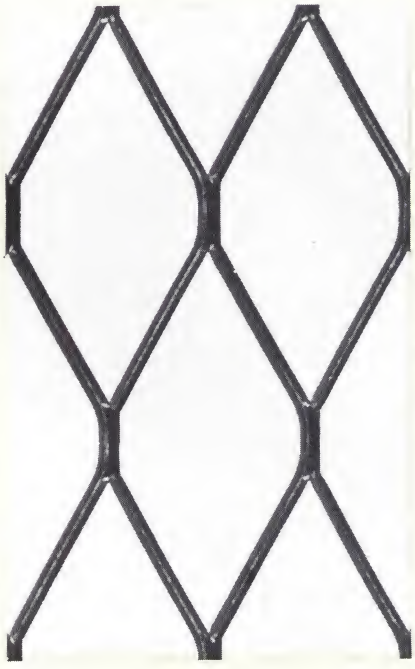


¾" No. 13
FLAT. EXPAND-X

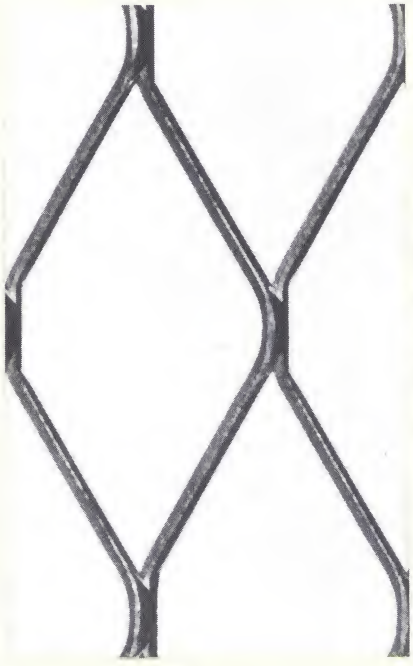
¾" No. 9
FLAT. EXPAND-X



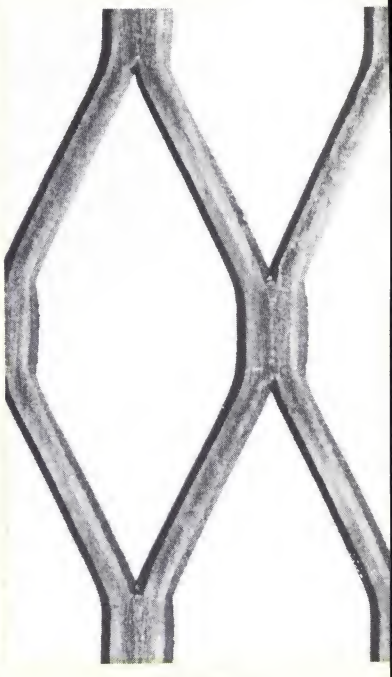
¾" No. 16
EXPAND-X



1" No. 16
EXPAND-X



1½" No. 13
EXPAND-X



1½" No. 9
FLAT. EXPAND-X

ordering information

Style—The style numbers designate the various meshes. The first figure is the nominal width of the diamond. The second figure identifies the style. In some cases, this figure corresponds with the gauge of the sheet before expanding. Specify regular or flattened sheets.

specifying sheet size

Width—The width of the sheet is measured the *short way of the diamond* (SWD).

Length—The length of the sheet is measured the *long way of the diamond* (LWD).

When ordering expanded metal, specify "SWD" and "LWD" after the width and length of the sheet. Give width first. *Example:* A sheet 36″ the short way of the diamond by 96″ the long way of the diamond should be written—

36″ SWD x 96″ LWD
(*Note SWD dimension is given first*)

maximum tolerances on stock size sheets	**Width**—SWD—plus 3/16″ per foot of width
	Length—LWD—plus ¾″ for lengths 96″ to 119″
	plus 1″ for lengths 120″ to 143″
	plus 1½″ for length 144″

types of shearing available

Random Shearing—Cut to width (SWD), or length (LWD), with tolerance of plus or minus 1/16″. This type of shearing will usually leave jagged edges or prongs. (*Note:* 4″ ARMORWEAVE cannot be random sheared.)

Bond Shearing—Cut on the centerline of the first bond over the specified width (SWD), or length (LWD), with tolerance of minus 0″, plus ½ diamond. This type of shearing provides closed diamonds along the shearing line.

Note: Flattened EXPAND-X, flattened decorative expanded metal and small size meshes in regular EXPAND-X cannot be bond sheared; however, a closed diamond pattern may be obtained by expanding special size sheets "to size" with the standard expanding tolerance of 3/16″ per foot of width.

The following combinations of shearing types are common:

Bond Shear SWD, and LWD—provides closed diamonds all around. Tolerance: −0″ +½″ diamond SWD, and LWD.

Bond Shear SWD, Random Shear LWD—provides closed diamonds SWD and random cut to exact dimension LWD. Tolerance: −0″ +½″ diamond SWD, ±1/16″ LWD.

Random Shear SWD and LWD—provides random cuts to exact dimension SWD and LWD. Tolerance: ±1/16″ SWD and LWD.

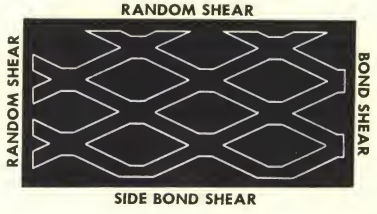
Expand-to-size SWD, Random Shear LWD—provides closed diamonds SWD and random cuts to exact dimension LWD, Tolerance: −0″ +3/16″ per foot of width SWD, ±1/16″ LWD.

Balanced Shearing—A symmetrical pattern in either the SWD or LWD dimension will be furnished when "balanced" shearing is requested. Balanced shearing is normally specified as follows:

Balance Random Shear SWD and LWD—provides a pattern symmetrical about a centerline both SWD and LWD. Tolerance: ±1/16″.

Bond Shear SWD, Balance Random Shear LWD—provides closed diamonds SWD and a symmetrical pattern LWD. Tolerance: −0″ +½″ diamond SWD, ±1/16″ LWD.

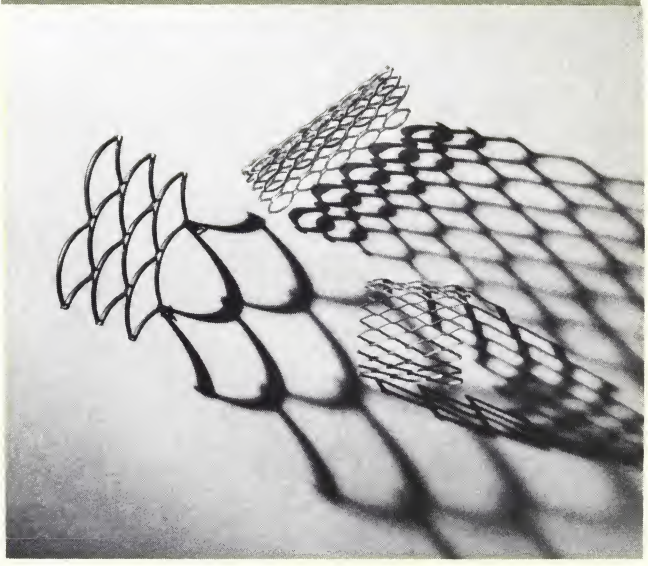
Squareness—Maximum "out of squareness" of all sheared material (when all four sides are sheared) shall not exceed 1/16″ per foot of length.



USG® Expanded Metals for Architecture

av 95

A.I.A. File No. 15-T/30-J



description and utility

To meet the increasing demands of new design concepts, architects are constantly searching for new materials that will satisfy unusual design requirements and perform precise functional roles at costs within strict budgeted limits.

Such a material is USG Expanded Metal—slit, cold-drawn solid metal that is formed, not punched, into patterns that stretch the imagination . . . lightweight strength that opens up design opportunities unlimited, particularly for fascia panels and balcony railings . . . functional beauty and economy that are strikingly effective in major new construction or remodeling projects.

United States Gypsum, a pioneer in developing expanded metals for architecture, has the industry's most complete line of structural expanded metals available for America's buildings. These products may be divided into six major groups:

1. Carbon Steel EXPAND-X*—a diamond-shaped pattern available in a variety of weights and mesh sizes to meet varying conditions. Its advantages over solid sheets—greater strength with less weight, visibility, free passage of light and air—make it ideally suited where protection, reinforcement, air flow and lighting are important.

2. Aluminum EXPAND-X—diamond-shaped patterns that combine the characteristics of lightweight aluminum alloy 3003-H14 with those added in the expanding process.

3. Stainless Steel EXPAND-X—diamond-shaped patterns with the advantages inherent in stainless steel alloy Type 304, plus the advantages peculiar to the expanded metal design.

4. Flattened EXPAND-X—when carbon steel, aluminum and stainless steel EXPAND-X are flattened after expanding, the smooth level surface produced makes these expanded metals adaptable to hundreds of other uses.

5. Decorative Meshes—six patterns and numerous weights and mesh sizes available to meet esthetic design requirements while providing the usual utility of expanded metals.

6. GRATE-X* Expanded Metal Grating—a heavy duty expanded metal used for gratings, walkways, platforms, stair treads, flooring, scaffolding. Available in 8 styles to meet various loading requirements. See USG Catalog AV-96, Sweet's Section 13a/Ug for details.

In USG Expanded Metals, these desirable characteristics are found:

Lightweight—USG Expanded Metals, slit and cold drawn into continuous sheets, weigh about one-third as much as the original solid metal sheets.

High Strength—The strands and bonds of expanded metal lie at a sharp angle to the original plane of the sheet, adding rigidity—greater resistance to bending.

Large Open Area—permits maximum passage of light and air.

Unique Directional Properties—The angular cut of some meshes gives them directional properties to screen or shade light from one side while permitting light and air to pass through.

Easily Fabricated—Meshes are readily formed in the same manner as sheet metals. They do not ravel when cut; may be welded without difficulty.

Easily Finished—The smooth scale-free surface of USG Expanded Metals makes quality finishing possible. The resultant corrosion resistance keeps maintenance costs low. Many delightful color combinations are obtained using painted, plated, anodized or porcelain enameled USG Expanded Metals in correlation with colored fabrics of other materials.

Versatile—A wide choice of mesh sizes, patterns, alloys, gauges and weights available to meet design requirements.

Economical—Considering the above properties, USG Expanded Metals are economical—cost much less than other types of decorative metals.

Nationwide Distribution—Whatever your need for expanded metal, a U.S.G. Expanded Metal Distributor is ready to serve you. His warehouse is stocked with USG Expanded Metals to assure you of the prompt service you need when you need it. Contact the U.S.G. Sales Office for the name of the nearest distributor.

The architectural uses of these versatile patterns are virtually limitless. Their beauty and directional properties make them suitable for interior or exterior space control. Because of their strength, durability and maintenance-free characteristics, they offer ideal protection for balconies and stair wells while making a tangible contribution to the building design. For more information on this application, see page 3.

The decorative qualities coupled with directional properties make ARMORWEAVE Expanded Metal ideally suited for building facades and sunshading. This application is covered in separate USG Systems Folder "ARMORWEAVE Fascia Walls," e-1816, to be found in Sweet's Section 12.

A few of the other representative uses for USG Expanded Metals are:

- Areaway Guards
- Shelving
- Storage Lockers
- Stairway Enclosures
- Laundry Partitions
- Factory Enclosures
- Skylight Guards
- Ornamental Screens
- Room Dividers
- Ceilings
- Partitions
- Accent Points
- Security Protection
- Decorative Trim
- Patio Coverings
- Building Facades
- Ornamental Grilles
- Sun Screens
- Jalousie Covers
- Shutters
- Fencing
- Louvers
- Awnings
- Space Dividers
- Folding Door Grilles
- Sign Backgrounds

general limitations

If an aluminum mesh is attached to a steel frame, a gasket of rubber or other non-conductor should be used to provide insulation and prevent galvanic corrosion. All meshes should be rigidly attached to the framing at approximately 6″ centers. Bending decorative meshes on a very short radius, particularly when repeated, may cause fracturing. Hot-dipped galvanization is not recommended for ARMORWEAVE pattern. Aluminum meshes to be erected without finishing should be thoroughly cleaned before erecting to eliminate dirt, soot and oils which can accumulate on the surface.

A.I.A. File No. 15-T/30-J

*Reg. U.S. Pat. Off.

types and functions

1. Carbon Steel EXPAND-X Expanded Metal

A diamond-shaped product manufactured from soft open hearth steel sheets. The strands and bonds are at a sharp angle to the original plane of the sheet, thus distributing strain in many directions to the supporting structure and improving rigidity and bending resistance.

There are no rivets or welded joints except where units are joined. The material can be readily cut into desired shapes without danger of raveled strands and may be welded, bent and formed. However such fabrication *must* be indicated on the face of the order so that material with proper ductility can be furnished.

Carbon Steel EXPAND-X is suitable for a vast number of applications where protection, reinforcement, greater strength with less weight, air flow and lighting are required.

Available in a wide selection of styles: six diamond sizes, six gauges, various sheet sizes depending on style (see page 4 for details). Shipped unpainted and unfinished but lightly oiled to inhibit rusting.

2. Aluminum EXPAND-X Expanded Metal

With diamond shaped openings, is manufactured from aluminum alloy type 3003-H14. While other alloy types may be expandable, 3003-H14 is best suited and provides wide utility, high corrosion resistance, adequate strength, and low cost. Meshes formed from this alloy can be either anodized or porcelain enameled.

Aluminum EXPAND-X has all the advantages of aluminum, plus lighter weight, higher strength, and a clean attractive design which are added in the expanding process. These characteristics permit the use of lighter weight structural supports and framing. Aluminum EXPAND-X fabricates easily; can be cut without raveling and is readily formed and welded.

The highly pleasing appearance of Aluminum EXPAND-X—its clean, geometric design, its lasting, corrosion-resisting, satiny finish—suggest a multitude of interior and exterior applications for the product.

Available in a wide selection of styles: three diamond-shaped opening sizes, three gauges, and sheet sizes 3′x8′ and 4′x8′ (see page 4 for details). Shipped unbuffed and unpolished.

3. Stainless Steel EXPAND-X Expanded Metal

Has diamond-shaped openings and is manufactured from alloy Type 304, 18-8 (18% chrome, 8% nickel) austenitic stainless sheets. Certain other alloy types of expanded stainless steel can be furnished on request.

Stainless Steel EXPAND-X offers architects a material that combines the properties inherent in stainless steel with the characteristics found in expanded metal. Stainless steel is highly resistant to most types of corrosion and oxidation. This makes it ideal for applications in chemical, oil, textile, food processing, meat packing, dairy and beverage industries.

Available in many styles: three diamond-shaped opening sizes, four gauges and sheet sizes 3′x8′ and 4′x8′ (see page 4 for details). Shipped unbuffed and unpolished.

4. Flattened EXPAND-X Expanded Metal

Made by passing the diamond-shaped expanded metal between pressure rolls. These flatten the material so that strands and bonds are in the same plane and produce a material suitable for applications where a flat smooth surface is desired. Carbon Steel, Aluminum and Stainless Steel Flattened EXPAND-X are available from stock (see page 4 for details).

5. Decorative Expanded Metals

All decorative patterns of USG Expanded Metals offer the architect countless new design possibilities. These attractive, functional and economical materials are produced from both soft open hearth carbon steel and aluminum alloy 3003-H14 sheets. Where required for unmaintained exterior surfaces, these decorative meshes can be specially made from "ANOCLAD" or equivalent sheets.

In manufacture, sheets of metal are slit and cold-drawn into continuous mesh patterns. The strands and bonds of the resulting meshes come to rest at a sharp angle to the original sheet. This makes the expanded mesh more rigid than a solid sheet and gives it a three-dimensional effect which adds texture. USG Expanded Metal in this form is called "Type R". For applications where a smooth surface is desired, a flattened form of each pattern except ARMORWEAVE, 1″ CATHEDRAL and LYRIC is produced by cold-rolling the mesh after expansion. Flattened meshes are designated as "Type F".

ARMORWEAVE, a sturdy, massive, handsome mesh pattern, is produced in ½″, 1½″ and 4″ styles to adapt to varying proportion requirements. Its wide-offset strands and bonds give ARMORWEAVE several unique and valuable properties. Because of them, ARMORWEAVE has excellent shading and concealing power, pleasing depth and texture, and added strength and rigidity. Yet this mesh retains a high percentage of open area for passage of air and usable light. These reasons make ARMORWEAVE an ideal material to use for ventilation panels, grilles, exterior fascias and sunshades. ARMORWEAVE placed vertically gives 100% shading at a 45° profile angle. In many cases, initial savings on air-conditioning equipment will more than pay for the entire ARMORWEAVE sunshading installation. See USG Systems Folder e-1816, "ARMORWEAVE Fascia Walls," for details of this application.

FESTOON, a light, airy mesh pattern with a maximum percentage of open area is also produced in ½″, 1½″ and 4″ styles. Combined with its attractive appearance, these characteristics make it an excellent material to specify for space dividers, decorative grilles, balcony railings, etc.

CATHEDRAL, with its long, thin modern lines, may be placed as shown or rotated 90° to provide a horizontal or vertical accent. Available in ½″ and 1″ styles.

LYRIC, suggested by the graceful form of the lyre, offers new opportunity to add distinctive decoration and beauty to balcony railings. Available in 1″ style; produced from aluminum only.

WAVELENGTH & RONDO. The unique and distinctive appearance of these two meshes warrants their consideration for many uses; particularly adaptable as accent points and decorative grilles and fencing.

USG Expanded Metals for balcony railings

For balcony railings, graceful USG Expanded Metals permit a clear view, provide a strong, durable barrier for safety and contribute to the beauty of the building design. Colorful, easy-to-install panels are available in expanded aluminum that can be anodized to resist weather and corrosion, or in carbon steel that can be plated, painted, enameled or plastic-coated in a variety of attractive colors. These treated expanded metals are corrosion-resistant, light in weight, easy to handle; won't ravel when cut; can be quickly fabricated and framed; and require little or no maintenance. With all this, USG Expanded Metals are economical—cost much less than other types of decorative metals. These characteristics make USG Expanded Metals ideally suited for balcony railings on motels, apartments and high-rise structures.

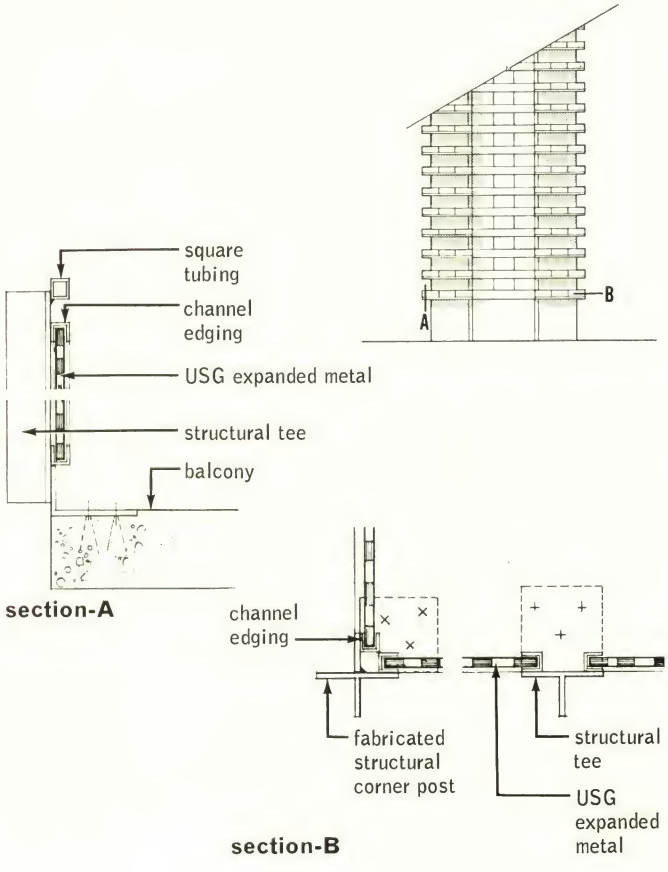
Four decorative Expanded Metal patterns are available for this use:

1. 1½″ EXPAND-X pattern (shown in photo, right), also available in ¾″ styles.
2. 1″ CATHEDRAL pattern, also available in ½″ style.
3. 1½″ FESTOON pattern, also available in ½″ and 4″ styles.
4. 1″ LYRIC pattern.

fastening and framing

USG Expanded Metals adapt readily to framing sections and fastenings which are common in architectural use. Shown below are typical details for use as a guide to the architect and fabricator.

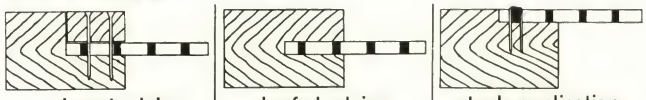
typical details



edgings for expanded metal

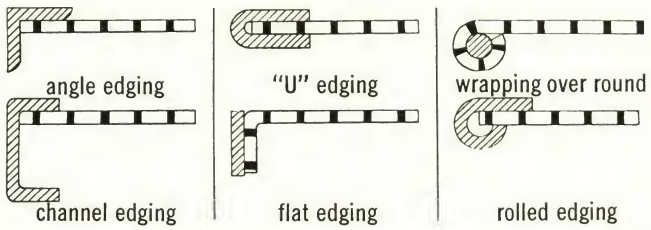
For more effective design and fabrication of products using Expanded Metals, the selection of the proper edging is highly important. Since USG Expanded Metals are readily adapted to various edging materials, the designer's choice of edging will usually be governed by the end use of the expanded metal assembly. Shown below is data on various edging materials and how to use them to provide greater flexibility of design, utility, economy and complete safety with USG Expanded Metals.

Wood Edging



Softwoods are suitable for general utility edgings; however, greater permanence, wearability and beauty are obtained with hardwood edgings. Cost, availability and end use will affect the type of wood used.

Aluminum (1) or Steel Edging

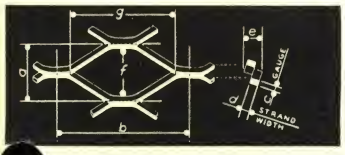


Steel edgings are popular for their high strength and ease of fabrication. Hot rolled angles, rounds, bars or channels and cold rolled U-edging or other specialty sections are also suitable for edging expanded metal. (1) Other rolled or extruded shapes can be used.

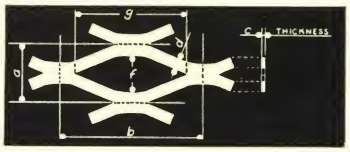
technical data—EXPAND-X expanded metal

styles available	wt. lbs. c sq. ft. black	wt. lbs. c sq. ft. galv.	diamond size a x b inches	opening size f x g inches	strand c x d inches	overall thickness e inches	standard sheet size SWD width	standard sheet size LWD length	per cent open area	gauge material used (1)
Carbon Steel EXPAND-X										
¼"—No. 20	86	131	.26 x1.0	.125x .687	.036x.076	.125	4′	8′	40	20
¼"—No. 18	114	159	.26 x1.0	.125x .687	.047x.076	.125	4′	8′	40	18
½"—No. 40	40	60	.497x1.195	.406x .937	.047x.050	.110	4′	8′	83	18
½"—No. 20	43	59	.459x1.195	.375x .875	.036x.066	.134	4′	8′	71	20
½"—No. 18	70	84	.507x1.195	.375x .950	.047x.089	.161	4′ & 6′	8′ & 10′	65	18
½"—No. 16	86	104	.507x1.195	.375x .890	.059x.089	.159	4′ & 6′	8′ & 10′	65	16
½"—No. 13	147	175	.503x1.2	.350x .900	.089x.098	.199	4′ & 6′	8′ & 10′	61	13
¾"—No. 34	34	51	.865x2.0	.750x1.688	.059x.060	.129	4′	8′	85	16
¾"—No. 16	54	65	.880x2.0	.700x1.640	.059x.095	.183	4′ & 6′	8′ & 10′	76	16
¾"—No. 13	80	93	.880x2.0	.734x1.640	.089x.095	.185	4′ & 6′	8′ & 10′	76	13
¾"—No. 10	120	133	.889x2.0	.675x1.563	.089x.141	.277	4′ & 6′	8′	69	13
¾"—No. 9	180	202	.857x2.0	.600x1.45	.134x.137	.290	4′ & 6′	8′ & 10′	68	10
1" —No. 16	47	55	1.01 x2.375	.875x1.937	.059x.095	.196	4′	8′	82	16
1½"—No. 16	40	47	1.35 x3.00	1.180x2.60	.059x.112	.210	4′	8′	85	16
1½"—No. 13	60	68	1.35 x3.00	1.200x2.60	.089x.112	.213	4′, 5′ & 6′	8′ & 10′	85	13
1½"—No. 10	79	87	1.33 x3.00	1.156x2.52	.089x.140	.248	4′ & 6′	8′ & 10′	81	13
1½"—No. 9	119	129	1.33 x3.00	1.140x2.43	.134x.141	.289	4′ & 6′	8′ & 10′	76	10
1½"—No. 6	250	273	1.33 x3.00	1.000x2.312	.198x.203	.410	Note 1		70	6
2" —No. 10	68	77	1.85 x4.0	1.625x3.43	.089x.164	.296	Special Order		83	13
2" —No. 9	90	102	1.85 x4.0	1.562x3.375	.134x.149	.296	Special Order		84	10
Carbon Steel Flattened EXPAND-X										
¼"—No. 20	83	125	.26 x1.03	.088x .70	.031x.086	.031	3′ & 4′	8′	34	20
¼"—No. 18	111	159	.26 x1.03	.088x .70	.042x.086	.042	3′ & 4′	8′	34	18
½"—No. 40	39	60	.497x1.23	.371x1.00	.038x.063	.038	3′ & 4′	8′	75	18
½"—No. 20	41	42	.438x1.25	.313x .938	.032x.070	.032	3′ & 4′	8′	64	20
½"—No. 18	66	88	.507x1.26	.289x1.00	.038x.109	.038	3′ & 4′	8′ & 10′	58	18
½"—No. 16	82	112	.507x1.26	.301x1.00	.050x.103	.050	3′ & 4′	8′ & 10′	60	16
½"—No. 13	138	175	.503x1.26	.259x .97	.070x.122	.070	3′ & 4′	8′ & 10′	52	13
¾"—No. 34	32	51	.865x2.10	.709x1.75	.045x.078	.045	4′	8′	83	16
¾"—No. 16	51	71	.880x2.10	.650x1.75	.048x.115	.048	3′ & 4′	8′ & 10′	74	16
¾"—No. 14	64	70	.880x2.10	.642x1.75	.063x.119	.063	3′ & 4′	8′	73	14
¾"—No. 13	76	93	.880x2.10	.642x1.75	.070x.119	.070	3′ & 4′	8′ & 10′	73	13
¾"—No. 9	171	195	.857x2.10	.529x1.63	.110x.164	.110	3′ & 4′	8′ & 10′	62	10
1" —No. 16	45	55	1.01 x2.50	.780x2.06	.048x.115	.048	3′ & 4′	8′	78	16
1½"—No. 16 (Lt.)	29	40	1.35 x3.13	1.14 x2.71	.048x.103	.048	3′ & 4′	8′	87	16
1½"—No. 16 (Hvy.)	38	44	1.35 x3.19	1.13 x2.69	.048x.123	.048	3′ & 4′	8′	85	16
1½"—No. 14	50	63	1.35 x3.15	1.07 x2.68	.063x.138	.063	3′ & 4′	8′	80	14
1½"—No. 13	57	68	1.35 x3.15	1.07 x2.68	.070x.138	.070	3′ & 4′	8′ & 10′	80	13
1½"—No. 9	113	129	1.35 x3.25	1.00 x2.62	.106x.175	.106	3′ & 4′	8′ & 10′	74	10
Stainless Steel EXPAND-X										
½"—No. 18	73	...	.475x1.20	.359x .906	.050x.082	.154	3′ & 4′	8′	65	18
½"—No. 16	91	...	.475x1.20	.359x .875	.062x.082	.161	3′ & 4′	8′	65	16
¾"—No. 18	48	...	.828x2.00	.719x1.656	.050x.101	.176	3′ & 4′	8′	77	18
¾"—No. 16	60	...	.828x2.00	.672x1.656	.062x.101	.178	3′ & 4′	8′	77	16
¾"—No. 13	91	...	.828x2.00	.672x1.563	.093x.101	.192	3′ & 4′	8′	77	13
¾"—No. 9	205	...	.828x2.00	.500x1.375	.140x.152	.294	3′ & 4′	8′	65	10
1½"—No. 16	45	...	1.333x3.00	1.180x2.813	.062x.115	.296	3′ & 4′	8′	83	16
1½"—No. 13	68	...	1.333x3.00	1.156x2.640	.093x.115	.221	3′ & 4′	8′	83	13
1½"—No. 9	137	...	1.333x3.00	1.125x2.500	.140x.154	.267	3′ & 4′	8′	77	10
Stainless Steel Flattened EXPAND-X										
½"—No. 18	69	...	.475x1.26	.297x1.031	.042x.093	.042	3′ & 4′	8′	61	18
½"—No. 16	86	...	.475x1.26	.297x1.031	.052x.093	.052	3′ & 4′	8′	61	16
¾"—No. 18	46	...	.828x2.10	.656x1.813	.042x.108	.042	3′ & 4′	8′	74	18
¾"—No. 16	57	...	.828x2.10	.672x1.813	.052x.108	.052	3′ & 4′	8′	74	16
¾"—No. 13	88	...	.828x2.10	.578x1.781	.079x.108	.079	3′ & 4′	8′	74	13
¾"—No. 9	198	...	.828x2.10	.500x1.563	.119x.160	.119	3′ & 4′	8′	61	10
1½"—No. 16	43	...	1.333x3.15	1.031x2.875	.052x.124	.052	3′ & 4′	8′	81	16
1½"—No. 13	66	...	1.333x3.15	1.016x2.525	.079x.124	.079	3′ & 4′	8′	81	13
1½"—No. 9	131	...	1.333x3.15	.906x2.658	.119x.165	.119	3′ & 4′	8′	75	10
Aluminum EXPAND-X										
½"—No. .051	27	...	.507x1.195	.375x .950	.051x.089	.152	3′ & 4′	8′	65	16
½"—No. .081	41	...	.507x1.195	.375x .890	.081x.089	.178	3′ & 4′	8′	65	12
¾"—No. .051	17	...	.880x2.000	.700x1.640	.051x.104	.192	3′ & 4′	8′	78	16
¾"—No. .081 (Lt.)	32	...	.880x2.000	.700x1.640	.081x.122	.211	3′ & 4′	8′	78	12
¾"—No. .081 (Hvy.)	41	...	.880x2.000	.734x1.640	.081x.156	.270	3′ & 4′	8′	68	12
¾"—No. .125	65	...	.878x2.000	.650x1.500	.125x.160	.320	3′ & 4′	8′	74	8
1½"—No. .081	22	...	1.330x3.000	1.200x2.563	.081x.128	.226	3′ & 4′	8′	83	12
1½"—No. .125	43	...	1.330x3.000	1.130x2.400	.125x.160	.340	3′ & 4′	8′	85	8
Aluminum Flattened EXPAND-X										
½"—No. .051	25	...	.509x1.250	.328x1.000	.045x.091	.045	3′ & 4′	8′	64	16
½"—No. .081	39	...	.525x1.271	.297x1.000	.067x.103	.067	3′ & 4′	8′	59	12
¾"—No. .051	16	...	.893x2.125	.625x1.750	.040x.114	.040	3′ & 4′	8′	76	16
¾"—No. .081 (Lt.)	30	...	.893x2.125	.635x1.750	.070x.134	.070	3′ & 4′	8′	72	12
¾"—No. .081 (Hvy.)	39	...	.893x2.125	.547x1.750	.070x.172	.070	3′ & 4′	8′	63	12
¾"—No. .125	61	...	.891x2.140	.570x1.640	.106x.180	.106	3′ & 4′	8′	58	8
1½"—No. .081	18	...	1.375x3.125	1.094x2.625	.055x.144	.055	3′ & 4′	8′	77	12
1½"—No. .125	40	...	1.313x3.150	.950x2.500	.106x.190	.106	3′ & 4′	8′	71	8

(1) U. S. Standard Gauge for steel products; Brown & Sharp Gauge for aluminum products. All dimensions and weights are approximate.

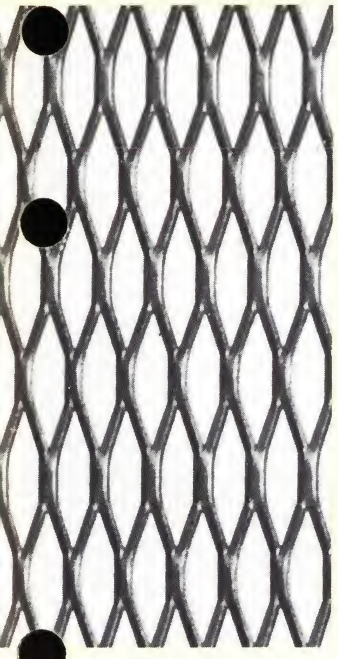


EXPAND-X

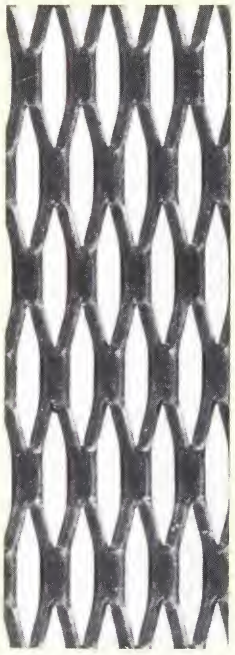


Flattened EXPAND-X

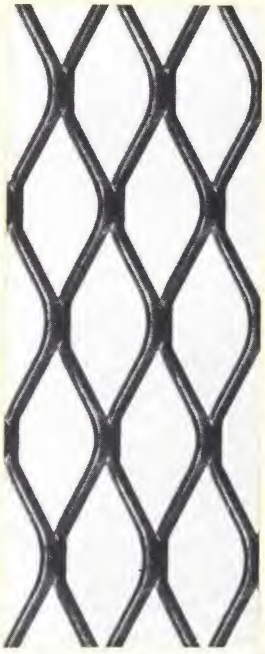
FULL SIZE



¼" No. 20
EXPAND-X



¼" No. 18
FLAT. EXPAND-X

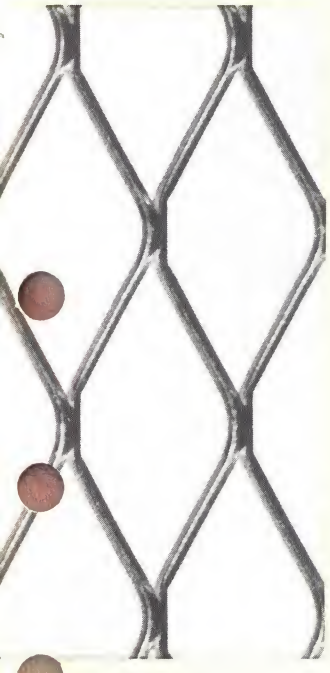


½" No. 18
EXPAND-X

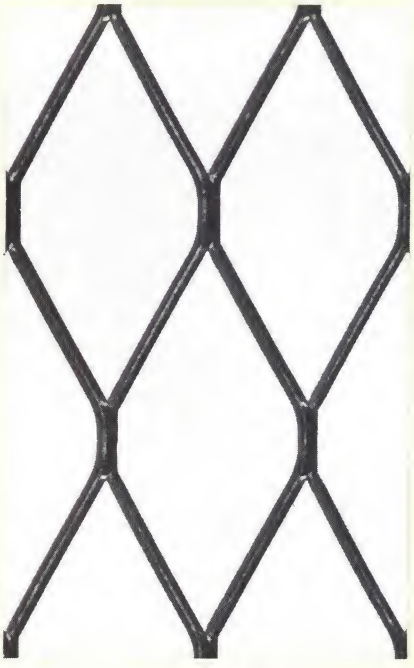
½" No. 13
FLAT. EXPAND-X

¾" No. 13
FLAT. EXPAND-X

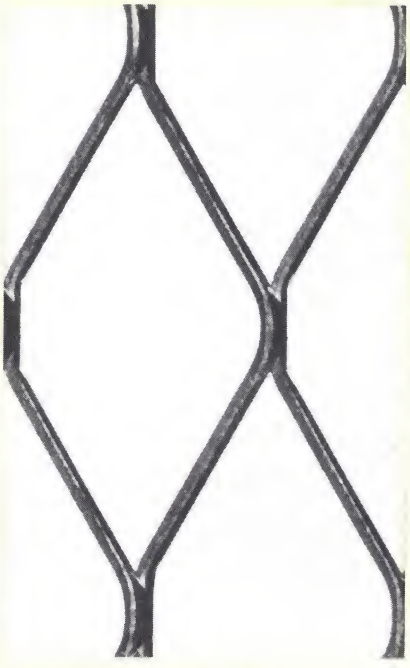
¾" No. 9
FLAT. EXPAND-X



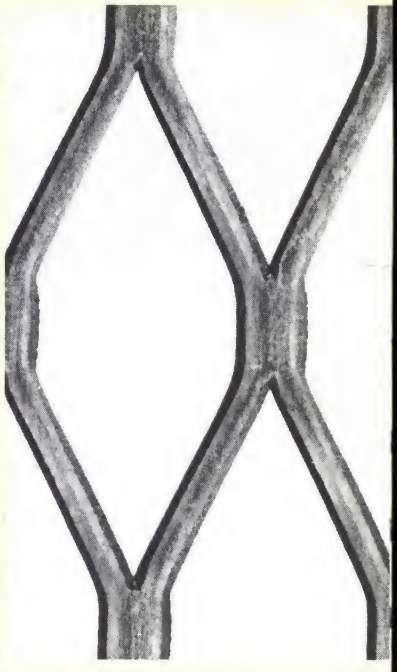
¾" No. 16
EXPAND-X



1" No. 16
EXPAND-X



1½" No. 13
EXPAND-X



1½" No. 9
FLAT. EXPAND-X

technical data—Decorative expanded metal

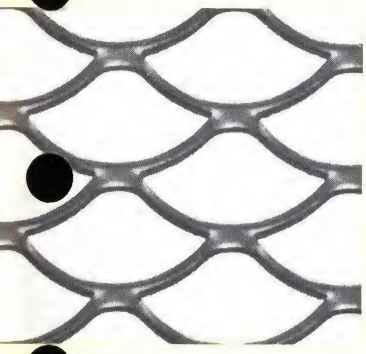
All dimensions and weights are approximate. "a" = SWO (Short Way of the Opening.) "b" = LWO (Long Way of the Opening).

pattern & material	reg. flat	style designation	design size a x b (inches)	opening size (inches)	strand size c x d (inches)	overall thickness e (inches)	standard sheet size width (SWO)	standard sheet size length (LWO)	per cent open area	wt.—lbs. per 100 sq. ft.
ARMORWEAVE										
Carbon Steel	R	½" #20	.60 x1.20	.410x .938	.036x.200	.219	4′	8′	34	100
		½" #18	.60 x1.20	.375x .938	.048x.200	.219	4′	8′	34	133
		½" #16	.60 x1.20	.375x .938	.060x.200	.219	4′	8′	34	166
		1½" #20 (L)	1.33 x3.00	.71 x2.26	.036x.500	.500	4′	8′	25	113
		1½" #20 (H)	1.50 x3.00	.65 x2.28	.036x.675	.600	4′	8′	10	135
		1½" #18 (L)	1.37 x3.00	.70 x2.26	.048x.500	.540	See Footnote 1		27	146
		1½" #18 (H)	1.50 x3.00	.54 x2.10	.048x.675	.550	See Footnote 1		10	180
		1½" #16 (L)	1.37 x3.00	.70 x2.30	.060x.500	.570	4′	8′	27	183
		*1½" #16 (H)	1.50 x3.00	.48 x2.03	.060x.675	.550	4′	8′	10	226
		4" #16 (L)	3.44 x8.00	1.625x6.25	.059x1.25	1.187	4′	8′ & 10′	30	182
		*4" #16 (H)	2.82 x8.00	.55 x5.05	.059x1.25	1.00	4′	8′ & 10′	20	224
Aluminum	R	½" .051	.60 x1.20	.375x .938	.051x.200	.219	4′	8′	34	48
		½" .081	.60 x1.20	.350x .938	.081x.200	.219	4′	8′	34	77
		1½" .051 (L)	1.24 x3.00	.520x2.10	.051x.500	.500	See Footnote 2		21	59
		1½" .051 (H)	1.47 x3.00	.400x2.00	.051x.675	.470	See Footnote 2		10	67
		1½" .081 (L)	1.26 x3.00	.520x2.10	.081x.500	.530	See Footnote 1		23	91
		1½" .081 (H)	1.46 x3.00	.430x2.00	.081x.675	.520	See Footnote 1		10	106
		4" .051 (L)	3.00 x8.00	.760x6.25	.051x1.25	1.020	4′	8′	25	61
		*4" .051 (H)	2.82 x8.00	.510x5.65	.051x1.25	.900	4′	8′	18	65
		4" .081 (L)	3.00 x8.00	1.250x6.00	.081x1.25	1.187	4′	8′ & 10′	20	96
		4" .081 (H)	2.82 x8.00	.500x5.30	.081x1.25	1.00	4′	8′ & 10′*	18	103
FESTOON										
Carbon Steel	R	½" #20	.625x1.20	.507x .938	.036x.090	.175	4′	8′	71	43
		½" #18	.625x1.20	.503x .938	.048x.090	.175	4′	8′	71	58
		*½" #16	.625x1.20	.500x .938	.060x.090	.175	4′	8′	71	72
		1½" #16	1.50 x3.00	1.375x2.625	.060x.112	.217	4′	8′	85	42
		*1½" #13	1.50 x3.00	1.313x2.625	.089x.112	.236	4′	8′	81	62
		*1½" #9	1.50 x3.00	1.25 x2.50	.135x.141	.292	4′	8′	81	115
		*4" #9	3.75 x8.00	3.50 x7.25	.134x.230	.500	4′	8′ & 10′	90	82
		*4" #4	3.75 x8.00	3.375x7.0	.223x.230	.500	4′	8′ & 10′	88	184
	F	½" #20	.688x1.20	.550x1.00	.030x.100	.030	8′	4′	64	39
		½" #18	.688x1.20	.545x1.00	.040x.100	.040	8′	4′	64	52
		*½" #16	.688x1.20	.540x1.00	.051x.100	.051	8′	4′	64	65
		1½" #16	1.688x3.00	1.438x2.625	.052x.125	.052	8′	4′	79	34
		*1½" #13	1.688x3.00	1.438x2.625	.071x.140	.071	8′	4′	81	51
		*1½" #9	1.75 x3.00	1.25 x2.50	.110x.204	.110	8′	4′	75	101
Aluminum	R	½" .051	.625x1.20	.507x .938	.051x.090	.175	4′	8′	71	21
		½" .081	.625x1.20	.467x .938	.081x.090	.175	4′	8′	71	33
		*1½" .081	1.375x3.00	1.25 x2.625	.081x.112	.250	4′	8′	83	19
		*1½" .125	1.50 x3.00	1.25 x2.563	.125x.141	.250	4′	8′	81	38
		*4" .250	3.375x8.00	3.0 x6.75	.250x.356	.625	4′	8′ & 10′	82	86
	F	½" .051	.688x1.20	.550x1.00	.043x.100	.043	8′	4′	64	19
		½" .081	.688x1.20	.580x1.00	.069x.100	.069	8′	4′	64	30
		*1½" .081	1.75 x3.00	1.375x2.625	.065x.160	.065	8′	4′	74	17
		*1½" .125	1.75 x3.00	1.375x2.563	.100x.190	.100	8′	4′	70	31
RONDO										
Carbon Steel	R	½" #20	.520x1.195	.469x .938	.036x.089	.163	4′	8′	65	52
		½" #18	.520x1.195	.453x .938	.048x.089	.163	4′	8′	65	71
		*½" #16	.520x1.195	.438x .938	.060x.089	.163	4′	8′	65	86
	F	½" #20	.625x1.195	.500x .938	.030x.100	.030	8′	4′	59	47
		½" #18	.625x1.195	.469x .938	.040x.100	.040	8′	4′	59	64
		*½" #16	.625x1.195	.438x .938	.051x.100	.051	8′	4′	59	78
Aluminum	R	½" .051	.520x1.195	.438x .938	.051x.089	.163	4′	8′	65	25
		½" .081	.520x1.195	.408x .938	.081x.089	.163	4′	8′	65	40
	F	½" .051	.625x1.195	.500x .938	.043x.100	.043	8′	4′	59	23
		*½" .081	.625x1.195	.475x .938	.069x.101	.069	8′	4′	59	36
WAVELENGTH										
Carbon Steel	R	*½" #20	.555x1.20	.468x .938	.036x.103	.171	4′	8′	63	55
		½" #18	.555x1.20	.453x .938	.048x.103	.171	4′	8′	63	74
		*½" #16	.555x1.20	.438x .938	.060x.103	.171	4′	8′	63	92
	F	*½" #20	.625x1.20	.500x .938	.030x.112	.030	8′	4′	57	50
		½" #18	.625x1.20	.438x .938	.040x.112	.040	8′	4′	57	67
		*½" #16	.625x1.20	.375x .938	.051x.112	.051	8′	4′	57	83
Aluminum	R	½" .051	.555x1.20	.438x .938	.050x.103	.171	4′	8′	63	27
		*½" .081	.555x1.20	.410x .938	.081x.103	.171	4′	8′	63	43
	F	½" .051	.625x1.20	.500x .938	.043x.112	.043	8′	4′	57	25
		*½" .081	.625x1.20	.475x .938	.068x.112	.068	8′	4′	57	39
CATHEDRAL			SHORT / LONG	SHORT / LONG						
Carbon Steel	R	½" #20	.458x1.0 / .458x2.0	.344x.75 / .344x1.75	.036x.089	.175	4′	8′	61	58
		½" #18	.458x1.0 / .458x2.0	.344x.75 / .344x1.75	.048x.089	.175	4′	8′	61	77
		½" #16	.458x1.0 / .458x2.0	.344x.75 / .344x1.75	.060x.089	.175	4′	8′	61	97
		1" #16	1.0x2.0 / 1.0x4.0	.750x1.5 / .750x3.5	.063x.200	.343	4′	8′	75	99
	F	½" #20	.534x1.0 / .534x2.0	.344x.75 / .344x1.75	.033x.092	.033	8′	4′	58	53
		½" #18	.540x1.0 / .540x2.0	.344x.75 / .344x1.75	.044x.092	.044	8′	4′	58	70
		½" #16	.562x1.0 / .562x2.0	.344x.75 / .344x1.75	.052x.092	.052	8′	4′	58	89
Aluminum	R	½" .051	.458x1.0 / .458x2.0	.344x.75 / .344x1.75	.051x.089	.175	4′	8′	61	28
		½" .081	.458x1.0 / .458x2.0	.344x.75 / .344x1.75	.081x.089	.175	4′	8′	61	45
		1" .081	1.0x2.0 / 1.0x4.0	.750x1.5 / .750x3.5	.081x.200	.343	4′	8′	75	46
	F	½" .051	.562x1.0 / .562x2.0	.344x.75 / .344x1.75	.046x.095	.046	8′	4′	58	26
		½" .081	.562x1.0 / .562x2.0	.313x.75 / .313x1.75	.068x.100	.068	8′	4′	58	41
LYRIC										
Aluminum	R	1" .125	1x1.813 / 1x3.125	.080x1.30 / .080x2.60	.125x.130	.250	See Footnote 4		75	46

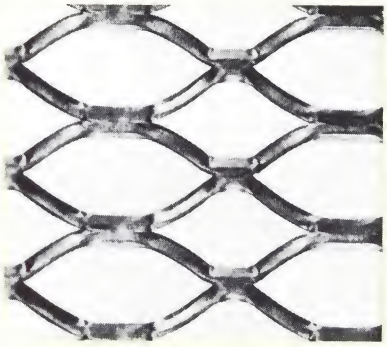
*Produced on special order.
(H) = Heavy Strand (L) = Light Strand

Footnote 1—Sheet Sizes are 4′x8′, 6′x8′, and 6′x6′-3″
2—Sheet Sizes are 4′x8′, 6′x8′, 6′x6′-3″, and 8′x4′
3—Sheet Sizes are 2′x4′, and 3′x8′
4—Sheet Sizes are 4′x8′ and 8′x4′

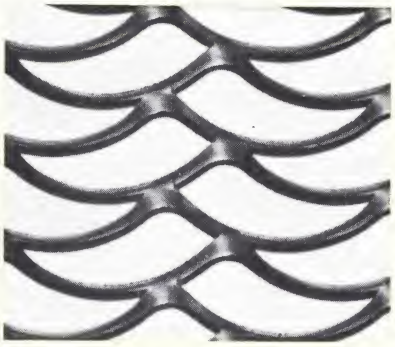
Note regarding positioning: The expanded metal may be rotated 90° or 180° from the positions shown in the adjacent photographs. This will achieve varying effects particularly with styles such as FESTOON, WAVELENGTH and CATHEDRAL; positioning of the mesh should be indicated on drawings.



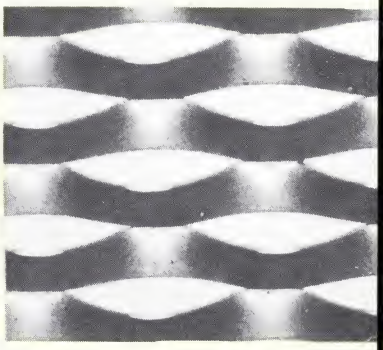
½″ FESTOON Type R



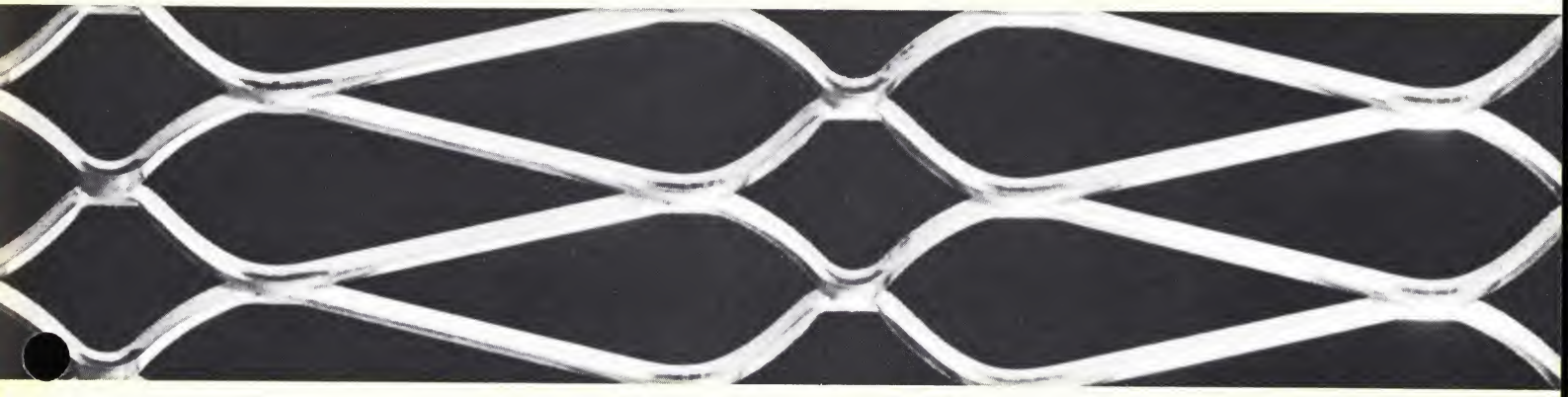
½″ RONDO Type R



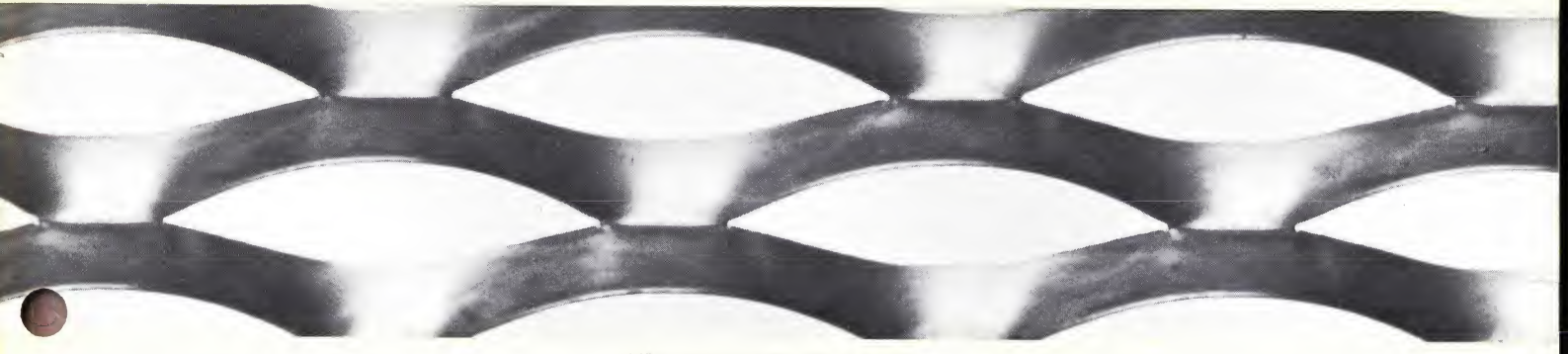
½″ WAVELENGTH Type R



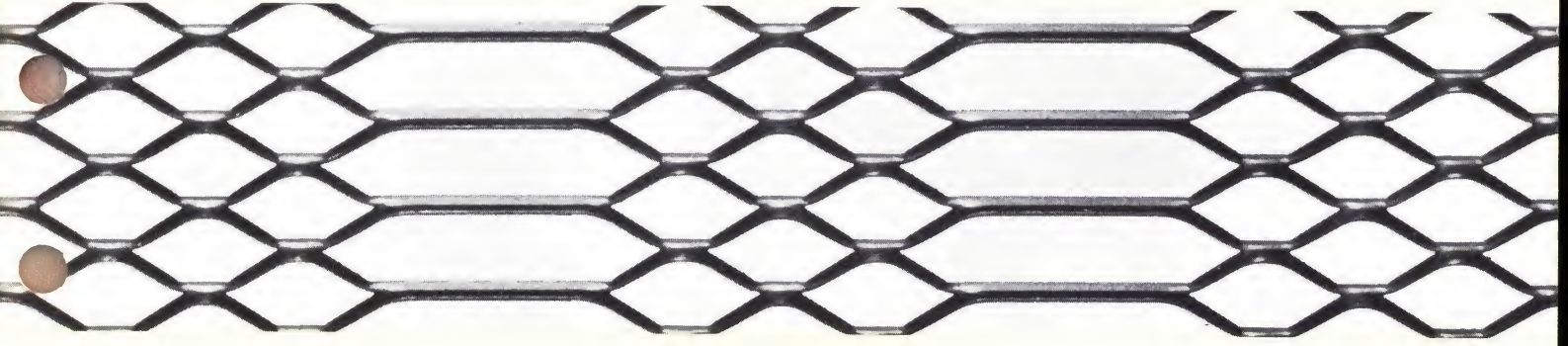
½″ ARMORWEAVE Type R



1″ LYRIC Type R



1½″ ARMORWEAVE Type R



½″ CATHEDRAL Type R

types of shearing available

Random Shearing—Cut to width (SWD), or length (LWD), with tolerance of plus or minus 1/16". This type of shearing will usually leave jagged edges or prongs. (*Note:* 4" ARMORWEAVE cannot be random sheared.)

Bond Shearing—Cut on the centerline of the first bond over the specified width (SWD), or length (LWD), with tolerance of minus 0", plus ½ diamond. This type of shearing provides closed diamonds along the shearing line.

Note: Flattened EXPAND-X, flattened decorative expanded metal and small size meshes in regular EXPAND-X cannot be bond sheared; however, a closed diamond pattern may be obtained by expanding special size sheets "to size" with the standard expanding tolerance of 3/16" per foot of width.

The following combinations of shearing types are common:

Bond Shear SWD, and LWD—provides closed diamonds all around. Tolerance: −0" +½" diamond SWD, and LWD.

Bond Shear SWD, Random Shear LWD—provides closed diamonds SWD and random cut to exact dimension LWD. Tolerance: −0" +½ diamond SWD, ±1/16" LWD.

Random Shear SWD and LWD—provides random cuts to exact dimension SWD and LWD. Tolerance: ±1/16" SWD and LWD.

Bond Shear SWD, Balance Random Shear LWD—provides closed diamonds SWD and a symmetrical pattern LWD. Tolerance: −0" +½ diamond SWD, ±1/16" LWD.

Squareness—Maximum "out of squareness" of all sheared material (when all four sides are sheared) shall not exceed 1/16" per foot of length.

ordering information

Style—The style numbers designate the various meshes. The first figure is the nominal width of the diamond. The second figure identifies the style. In some cases, this figure corresponds with the gauge of the sheet before expanding. Specify regular or flattened sheets.

specifying sheet size

Width—The width of the sheet is measured the *short way of the diamond* (SWD).

Length—The length of the sheet is measured the *long way of the diamond* (LWD).

When ordering expanded metal, specify "SWD" and "LWD" after the width and length of the sheet. Give width first. *Example:* A sheet 36" the short way of the diamond by 96" the long way of the diamond should be written—

36" SWD x 96" LWD
(*Note SWD dimension is given first*)

maximum tolerances on stock size sheets

Width—SWD—plus 3/16" per foot of width

Length—LWD—plus ¾" for lengths 96" to 119"
plus 1" for lengths 120" to 143"
plus 1½" for length 144"

specifications

scope—The contractor shall supply all labor, material and equipment to install the ARMORWEAVE Expanded Metal in all areas where shown on the drawings.

materials—USG Expanded Metal shall be (specify by complete style designation. *Example:* 1½"-18 (H) Carbon Steel ARMORWEAVE Expanded Metal.) (The architect should specify the finish required on the Expanded Metal, i.e., cleaned and painted, anodized, etc., with appropriate specifications for such finishing.)

installation—The Expanded Metal shall be attached to the supporting framework with (specify type of material, size and finish of fasteners) no greater than (specify distance) o.c.

aid to architects

To promote a better understanding of expanded metals and their use, and assure a satisfactory result, U.S.G. offers design and sales service to aid architects and designers. U.S.G. Representatives, see locations below, are equipped to assist in working out specific problems concerning design, fabrication, finishing and attachment of expanded metals.

U.S.G. SALES OFFICES, INDUSTRIAL STEEL: **CALIFORNIA**: Los Angeles, 388-1171; Oakland (San Leandro), 569-3020 • **COLORADO**: Denver, 388-6301 • **FLORIDA**: North Miami, 754-4554 • **GEORGIA**: Atlanta, 231-3180 • **ILLINOIS**: Chicago, 321-4100 • **INDIANA**: Indianapolis, 546-4775 • **KENTUCKY**: Louisville, 895-9478 • **LOUISIANA**: New Orleans, 822-0482 • **MARYLAND**: Baltimore, 377-8001 • **MASSACHUSETTS**: Boston (Cambridge), 491-6321 • **MICHIGAN**: Detroit (Southfield), 356-7755; Grand Rapids, 456-5113 • **MINNESOTA**: Minneapolis, 927-9911 • **MISSOURI**: Kansas City, 931-1388; St. Louis (Clayton), 721-1010 • **NEW JERSEY**: Newark (Clifton), 672-3900 • **NEW YORK**: Buffalo, 854-3427; New York City, 935-4433 • **NORTH CAROLINA**: Charlotte, 332-5023 • **OHIO**: Cincinnati, 961-4300; Cleveland Heights, 321-4141 • **PENNSYLVANIA**: Bryn Mawr, 525-7630; Pittsburgh, 561-4600 • **TENNESSEE**: Memphis, 324-3796 • **TEXAS**: Dallas, 351-5386; Houston, 524-7448 • **WASHINGTON**: Seattle, 633-0745.

GRATE-X* Expanded Metal Grating

av 96

A.I.A. File No. 14-A-1

description and utility

GRATE-X is a heavy duty type expanded metal, made of steel plate which is slit and expanded in a cold-drawing operation. Designed especially for use as a lightweight open steel flooring, GRATE-X is ideal for flooring, catwalks, platforms, stair treads, etc., where its principal use is for light storage and foot traffic. Many other practical uses are possible.

GRATE-X is also made from ¼" aluminum plate for uses. where the inherent properties of aluminum are required Among its advantages are:

Economical—Its low cost and light weight, combined with high strength, make for a most economical construction. A wide selection of sizes and weights is available.

High Strength—Formed like a truss, every interconnected strand acts as a structural member distributing the load in many directions, over a considerable area. There are no riveted or welded joints.

Easily Installed—The uniform pattern; ease of cutting with torch, bolt cutters or hacksaw; ease of anchorage with spot welding or bolting and ease of shaping to curved surfaces make for quick, easy installation. Holes may be cut or patched, and alterations made at will. Ease of fabrication permits stocking at user's plant for use as needed for alterations, additions, etc.

Extra Safety—The angular ridged surface formed by the multiple junctions of strands provides excellent anti-slip qualities. The closely-spaced long bond feature of GRATE-X provides greater contact area, resulting in a high traction surface, highly skid-proof yet smooth enough for wheel traffic. Snow and ice break off easily under foot, water and oil drain off readily; thus maintaining anti-slip qualities under adverse conditions.

Large Open Area—The angular position of the strands and bonds permits ready passage of light and air. Dust cannot accumulate. The percentage of open area is actually as great at an entrance angle of 45 degrees as at 90 degrees.

Easily Maintained—The angular position of strands and bonds and large open area make GRATE-X virtually self-cleaning. All surfaces can be readily reached for painting with brush or spray gun.

GRATE-X allows ready passage of air and light

specifications

scope—GRATE-X Expanded Metal Grating, shall be installed for all walkways and other areas where shown on drawings.

material—GRATE-X shall weigh (specify weight per square foot from Table 2).

(For steel) The steel used in manufacture shall comply with ASTM designation A-283-58T.

(For aluminum) The aluminum used in manufacture shall be 5052 H-32 alloy.

erection—Units of GRATE-X shall be installed with straight edge of bond up. GRATE-X shall be so placed that the direction of the long way of the diamond parallels the direction of the span. Attachment to framing shall be by welding at 6" intervals. Edges parallel to long way of diamonds shall be butted and welded on every second bond. Individual pieces of GRATE-X shall be placed in such a manner that the diamonds of one piece are aligned with those of adjacent pieces.

table 1—load test data with deflections in inches

Carbon Steel (3, 4, 5 and 7 lb.) Grate-X. Data from tests by Armour Research Foundation; 6.25 lb. data from U.S.G. Research.

concentrated load at center line—pounds per 12" widths	25" clear span					30" clear span					35" clear span					40" clear span			
	type of grating					type of grating					type of grating					type of grating			
	3.0 lb.	4.0 lb.	5.0 lb.	6.25 lb.	7.0 lb.	3.0 lb.	4.0 lb.	5.0 lb.	6.25 lb.	7.0 lb.	3.0 lb.	4.0 lb.	5.0 lb.	6.25 lb.	7.0 lb.	4.0 lb.	5.0 lb.	6.25 lb.	7.0 lb.
50	.060	.040	.037	.020	.011	.086	.061	.048	.030	.031	.147	.088	.068	.043	.051	.119	.089	.055	.062
100	.114	.082	.070	.035	.035	.169	.120	.093	.058	.062		.174	.138	.082	.089	.241	.177	.107	.111
150		.119	.102	.054	.062		.177	.140	.083	.093			.204	.120	.123		.260	.157	.159
200			.134	.072	.079			.181	.120	.117				.157	.155			.212	.205

Carbon Steel (3.14 and 4.27 lb.) and Aluminum (2.0 lb.) GRATE-X. Data from U.S.G. Research.

concentrated load at center line—pounds per 12" widths	carbon steel		carbon steel		carbon steel		carbon steel		aluminum (2.0 lb.)	
	23" clear span		29" clear span		35" clear span		41" clear span		clear span	
	3.14 lb.	4.27 lb.	3.14 lb.	4.27 lb.	3.14 lb.	4.27 lb.	3.14 lb.	4.27 lb.	20"	25"
50	.037	.024	.057	.043	.086	.083	.123	.097	.076	.118
100	.070	.050	.112	.095	.174	.156	.232	.192	.153	.237
150	.105	.080		.153		.223			.229	.355
200		.111		.209					.306	

Loading condition—concentrated load in lbs. per 12" of width applied at center of span. Deflections given in inches at center of span. Ends of grating rigidly fastened about 6" o.c.

A.I.A. File No. 14-A-1

*Reg. U.S. Pat. Off.

product data

table 2—weights (per square foot) and dimensions (inches)

style (psf)	diamond size width x length	opening size	strand width	strand thickness	GRATE-X depth	percent open area	sheet size width (SWD)	sheet size length (LWD)
Carbon Steel GRATE-X								
3.0 lb.	1.44 x 5.0	1.09 x 3.31	.23	.223	½	61%	48″ or 72″ x 60″, 96″ γ, 120″ or 144″	
3.14 lb.	2.000 x 6.0	1.625 x 4.875	.312	.250	9/16	69%	48″ or 72″ x 120″	
4.0 lb.	1.395 x 5.0	1.02 x 3.25	.30	.223	⅝	54%	48″, 60″ or 72″ x 60″, 96″ γ or 120″	
4.27 lb.	1.412 x 4.0	1.0 x 2.88	.30	.250	⅝	58%	48″ or 72″ x 96″	
5.0 lb.	1.143 x 5.0	.72 x 2.88	.31	.223	⅝	48%	48″ x 60″, 96″ γ or 120″, 60″ x 96″	
6.25 lb.	1.412 x 5.0	.781 x 3.125	.380	.284	47/64	46%	48″ or 72″ x 96″ γ (1)	
7.0 lb.	1.333 x 5.0	.70 x 2.75	.40	.284	¾	40%	48″ x 100″ (1)	

γ—Length shown is nominal, actual length—97½″. (1) 72″ x 75″ also available.

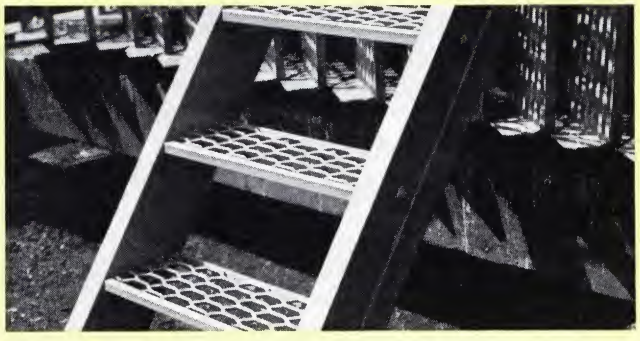
Aluminum GRATE-X								
2.0 lb.	1.25 x 5.0	.73 x 2.88	.356	.250	⅝	43%	60″ x 120″	

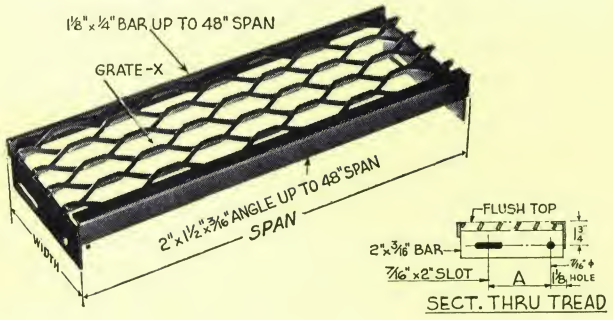
NOTE: Special sizes on request. Specify sizes by giving diamonds SWD (short way of diamond) by LWD (long way of diamond) respectively.

#2 Projection Mesh								
1.87 lb.	1.125 x 5.0	.88 x 3.19	.187	.134	11/16	67%	6′ x 10′ and 4′ x 8′	

GRATE-X stair treads

GRATE-X stair treads have all the advantages of GRATE-X and are ideal for fire escapes and all types of industrial and ship stairways. The treads are completely prefabricated by U.S.G. and shipped to the customer ready for installation. The stair treads are easily installed by a simple attachment with bolts and nuts to standard steel channel stringers. Bolts and nuts for attachment are not furnished with the treads. Tread lengths are available from 16 in. to 48 in. inclusive, in ½ in. increments. Standard widths are listed in table. Stock sizes available (painted): 4A Tread—8½″ x 24″ and 30″; 5A Tread—9¾″ x 30″ and 8½″ x 36″.





widths available

no. 4A tread (4 lb. GRATE-X)	no. 5A tread (5 lb. GRATE-X)	dimension "A" for both 4A & 5A
5¾″	6¼″	2½″
7⅛″	7⅜″	2½″
8½″	8½″	4½″
9⅞″	9¾″	6″
11¼″	10⅞″	7″

UNITED STATES GYPSUM
UNITED STATES GYPSUM
THE GREATEST NAME IN BUILDING
GENERAL OFFICES: 101 S. Wacker Drive, Chicago, Illinois 60606
Products made to Work Together

GRIP STRUT® Safety Grating

av 97

A.I.A. File No. 14-A-1

description and utility

GRIP STRUT Grating has been engineered to provide maximum safety underfoot, exceptional load-carrying capacity for intermediate span lengths, and lightweight, self-framing, one-piece construction. As such it is ideally suited for all types of work platforms, open flooring, catwalks, balconies, storage areas, walkways and stair treads. It has been extensively used by the aircraft, food processing, oil and automobile industries.

GRIP STRUT, a unique material, has reticulated and formed metal cross struts arranged in a diamond pattern with integrally formed channels at the edges. The cross struts form a slip-resistant, resilient walking surface with sufficient open area to provide ample passage of light and air. Two types of GRIP STRUT Grating are available:

1. GRIP STRUT Safety Grating provides a highly slip-resistant serrated surface for use under conditions where safety underfoot is a prime requirement. Material meets anti-slip values set forth in Federal Specifications RR-G-661-b. Listed under Reexamination Service of Underwriters' Laboratories, Inc.; see Accident Equipment List, Guide No. 120 LO.

2. GRIP STRUT Intermediate Span Grating (non-serrated) provides a high strength, lightweight pedestrian trafficway, platform or storage deck.

A variety of channel depths and gauges is available in both types of GRIP STRUT to accommodate design loads needed for pedestrian traffic or those encountered in light storage or equipment installations (see safe load tables). GRIP STRUT is made up in either carbon steel, galvanized steel, aluminum, or stainless steel, to meet mild or heavy corrosive conditions. Widths from 4¾″ to 18¾″ and lengths up to 14′ are available to meet job layout requirements from narrow walkways or platforms to entire floor areas. Other features:

High Strength—lightweight, one-piece construction develops strength from the section and a high load capacity per pound. Some styles are suitable for spans up to 12′.

Safety Surface—the unique surface pattern makes GRIP STRUT Safety Grating slip-resistant in all directions.

Easily Installed—most sections can be handled by one man. Cuts readily; rapidly welded, bolted or clamped in place.

Large Open Area—permits free flow of air, heat and light. Many times eliminates need for additional sprinklers under catwalks and platforms.

Economical—low in initial cost. Quickly installed. Self-cleaning. Standard galvanized finish minimizes maintenance. Plain finish easily painted for low maintenance costs. Light weight with high strength can result in structural steel savings.

safe loading—steel—GRIP STRUT Grating

span (11¾″ wide material)

gauge	channel depth		2′-0″	2′-6″	3′-0″	3′-6″	4′-0″	4′-6″	5′-0″	5′-6″	6′-0″	6′-6″	7′-0″	7′-6″	8′-0″	9′-0″	10′-0″	11′-0″	12′-0″
#14 ga.	1½″	U	536	344	240	177	136	108	88	74	62								
		D	.06	.10	.14	.20	.26	.33	.41	.50	.60								
		C	525	422	353	304	267	239	216	198	183								
		D	.05	.08	.12	.16	.21	.26	.33	.40	.48								
	2″	U	890	571	397	293	225	178	145	120	102	87	76	66	59	47			
		D	.06	.09	.13	.17	.23	.29	.36	.43	.52	.61	.71	.83	.95	1.21			
		C	707	699	584	502	440	393	355	324	299	277	259	243	230	207			
		D	.04	.07	.10	.14	.18	.23	.29	.35	.42	.49	.57	.66	.76	.97			
	2½″	U	1021	655	456	336	258	204	166	138	116	100	86	76	67	54	44		
		D	.04	.06	.08	.11	.14	.18	.23	.28	.33	.39	.45	.52	.60	.77	.96		
		C	707	707	669	575	505	450	407	371	342	317	296	278	262	236	216		
		D	.02	.04	.06	.09	.12	.15	.18	.22	.26	.31	.36	.42	.48	.62	.77		
#12 ga.	1½″	U	710	456	318	235	181	144	117	98	83	71	62	55	49				
		D	.07	.11	.15	.21	.28	.35	.44	.53	.64	.76	.89	1.03	1.18				
		C	695	558	467	402	354	317	287	263	244	227	213	201	190				
		D	.05	.08	.12	.17	.22	.28	.35	.43	.51	.60	.71	.82	.95				
	2″	U	1131	725	505	372	286	227	185	154	130	111	97	85	75	60	50	42	
		D	.05	.08	.11	.16	.20	.26	.32	.39	.47	.56	.65	.75	.86	1.11	1.39	1.70	
		C	1107	888	742	638	561	501	453	414	382	355	332	312	295	266	243	224	
		D	.04	.06	.09	.12	.16	.21	.26	.31	.38	.44	.52	.60	.69	.89	1.11	1.36	
	2½″	U	1691	1083	753	554	425	337	273	226	191	163	141	123	109	87	71	59	50
		D	.04	.06	.09	.13	.17	.21	.26	.32	.38	.45	.52	.60	.68	.87	1.09	1.33	1.60
		C	1115	1115	1106	950	833	742	669	610	561	519	484	453	426	382	347	319	295
		D	.02	.04	.07	.10	.13	.17	.21	.25	.30	.36	.41	.48	.55	.70	.87	1.06	1.28
	3″	U	2138	1370	952	701	537	425	345	286	241	206	178	155	137	109	89	74	63
		D	.04	.06	.08	.11	.14	.18	.22	.27	.32	.38	.44	.51	.58	.74	.93	1.13	1.36
		C	1115	1115	1115	1115	1052	937	845	770	707	654	609	570	537	480	436	399	369
		D	.02	.03	.05	.08	.11	.15	.18	.22	.26	.31	.36	.41	.47	.60	.74	.90	1.09

safe loading—stainless steel—GRIP STRUT Grating

material	channel depth		span (11¾″ wide material) 2′-0″	2′-6″	3′-0″	3′-6″	4′-0″	4′-6″	5′-0″	5′-6″	6′-0″	6′-6″
#16 ga. Type 304	2″	U	583	374	261	192	148	118	96	80	68	58
		D	.05	.08	.11	.16	.20	.26	.32	.39	.47	.56
		C	464	458	383	330	290	259	235	215	199	185
		D	.03	.06	.09	.12	.16	.21	.26	.32	.38	.45

Conversion factors for other sizes per 12″ width of flooring (uniform load only)

width	4¾″	7″	9½″	11¾″	18¾″
factor	2.53	1.71	1.26	1.00	0.64

For load data on other sizes, see GRIP STRUT Grating Catalog.

safe loading—aluminum—GRIP STRUT Grating

material	channel depth		span (11¾″ wide material) 1′-6″	2′-0″	2′-6″	3′-0″
.081 Alloy 5052	2″	U	490	276	177	123
		D	.02	.04	.07	.09
		C	243	243	217	181
		D	.01	.03	.05	.08

U—uniform load, lbs./sq. ft.; C—concentrated load, lbs.; D—deflection in inches.

The above safe loads were determined in accordance with A.I.S.I. Light Gauge Cold Formed Steel Design Manual 1962, Section 6.

A.I.A. File No. 14-A-1

GRIP STRUT® Safety Grating

av 97

product data

available metals

a. carbon steel—hot rolled, pickled and oiled.
b. galvanized steel—hot dipped mill galvanized steel fabricated after galvanizing. In use the edges are protected by the electrochemical action of the zinc.
c. stainless steel—alloy type 304, 18-8 (18 chrome, 8 nickel) austenitic stainless. This alloy offers excellent corrosion resistance, high strength and good weldability.
d. aluminum—alloy 5052-0. In addition to light weight this alloy offers strength and corrosion resistance.

finishes

Standard: galvanized steel or plain steel painted with protective aluminum coating. Unpainted material is lightly oiled.

lengths

7′, 8′, 9′, 10′, 12′ and 14′ in steel and galvanized steel; 10′ and 12′ in stainless steel and aluminum.

styles available

gauge & type	channel height (1) widths →	weight—lbs. per lin. ft. 4¾″	7″	9½″	11¾″	18¾″
14 ga. steel	1½″	2.3	3.0	3.6	4.2	6.1
	2″	2.6	3.2	3.8	4.4	6.3
	2½″	2.8	3.5	4.1	4.7	6.6
12 ga. steel	1½″	3.2	4.1	5.0	5.9	8.5
	2″	3.6	4.5	5.4	6.2	8.9
	2½″	4.0	4.9	5.7	6.6	9.2
	3″	—	5.2	6.1	7.0	9.6
12 ga. aluminum	2″	.94	1.15	1.38	1.59	—
16 ga. stls. stl.	2″	—	—	3.2	3.27	—

(1) Add 5/16″ for overall depth

tread dimensions—steel and aluminum*

standard A	B	C	D	with abrasive nosing A	B	C	D
7″ 3 diam.	1½″ 2″	⅞″ 1⅛″	3⅜″	8⅛″ 3 diam.	1½″ 2″	⅞″ 1⅛″	4½″
9½″ 4 diam.	1½″ 2″	⅞″ 1⅛″	5⅞″	10½″ 4 diam.	1½″ 2″	⅞″ 1⅛″	6⅞″
11¾″ 5 diam.	1½″ 2″	⅞″ 1⅛″	8⅛″				

gauge and channel depth—steel

length	to 30″	to 36″	to 42″	to 48″
gauge	14	12	14	12
channel depth	1½″	1½″	2″	2″

*Aluminum stair treads fabricated from 2″ (.081″) GRIP STRUT—lengths up to 30″ only.

specifications

scope—The contractor shall supply all labor, material and equipment to install GRIP STRUT Grating, as specified, in all areas where shown on the drawings. Approved shop drawings are required before work proceeds.

materials—Grating shall be GRIP STRUT Grating, as manufactured by the Globe Division, United States Gypsum Company, with the following characteristics:

1. Type: (GRIP STRUT Safety Grating, serrated) (GRIP STRUT Intermediate Span Grating, non-serrated).
2. Metal: (carbon steel) (hot dipped mill galvanized steel) (stainless steel alloy type 304) (aluminum alloy 5052).
3. Finish: (mill galvanized before fabrication) (painted—one standard shop coat of aluminum primer) (unfinished, oiled).
4. Metal gauge: (14) (12) (16), (choose size from table, left).
5. Section width: (4¾″) (7″) (9½″) (11¾″) (18¾″), (choose size from table opposite).
6. Channel depth: (1½″) (2″) (2½″) (3″), (choose size from table opposite).

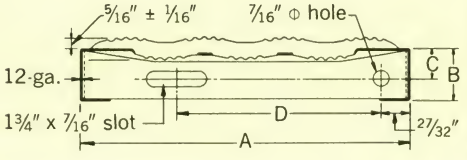
installation—Grating shall be installed as directed by manufacturer using (welds) (bolts) (anchoring devices).

distribution

GRIP STRUT Grating is stocked by distributors in principal cities. Consult the local classified telephone directory under Gratings—Steel Floor for qualified assistance.

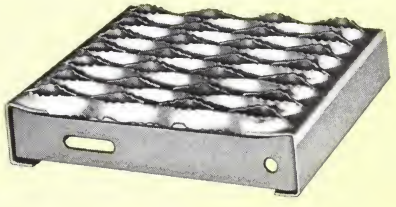
stair treads

GRIP STRUT Safety Grating is ideal for stair treads. There is a definite, natural, visual safety edge from one tread to another without the use of additional nosing material (see illustration). The treads are completely fabricated and shipped ready for bolting to stringers. If desired, treads may be fabricated locally from stock widths of GRIP STRUT. When required, treads are also available with a bolted-on abrasive nosing.



dimensions A, B, C, & D have a tolerance ±1/16″

treads available—serrated (safety edge as shown), or non-serrated



NOTE: Since methods and conditions of application and use are beyond the control of the United States Gypsum Company, its warranties of FITNESS and MERCHANTABILITY as well as any other warranties, express or implied, made in connection with the sale of these products, SHALL NOT BE EFFECTIVE OR ACTIONABLE UNLESS the products are applied according to United States Gypsum Company's directions and specifications. av-97

UNITED STATES GYPSUM

GLOBE DIVISION
UNITED STATES GYPSUM
THE GREATEST NAME IN BUILDING
GENERAL OFFICES: 101 S. Wacker Drive, Chicago, Illinois 60606

Products made to Work Together

GLOBE-STRUT* Channel Framing

av 98

description and utility

GLOBE-STRUT Channel Framing is a proven member of the United States Gypsum product family. Designed and manufactured by Globe Division to exacting USG standards, it serves in many places and many ways throughout industry.

GLOBE-STRUT Channel Framing satisfies a broad range of needs for a bolted framing system for most electrical, mechanical and industrial applications.

Rectangular channel frame members are rolled into a "U" section with an opening 7/8" wide at the top of the "U" (except 7/16" wide in sections G-1619 and G-3219). The basic sizes shown on page 2 make possible a wide variety of applications.

Multiple Channel Combinations—two or more basic channels welded back to back or side to side provide extra load capacities where required. They are also used to provide additional slot openings simply and efficiently.

types and functions

GLOBE-STRUT Channel Framing is available in either the basic solid continuous type or in three variations (see page 2 for sizes and product data). Knock-out, punch-out, and slotted channels are available in the same sizes.

Basic Channels with a solid continuous web can be assembled to frame-out general requirements as needed. A specially designed lock nut and cap screw will permit channel assembly at any position or in any basic combination with the other channel types.

Knock-out Channels have 7/8" diameter knock-outs on 6" centers starting 3" from the end. To specify, add suffix "KO" to product number.

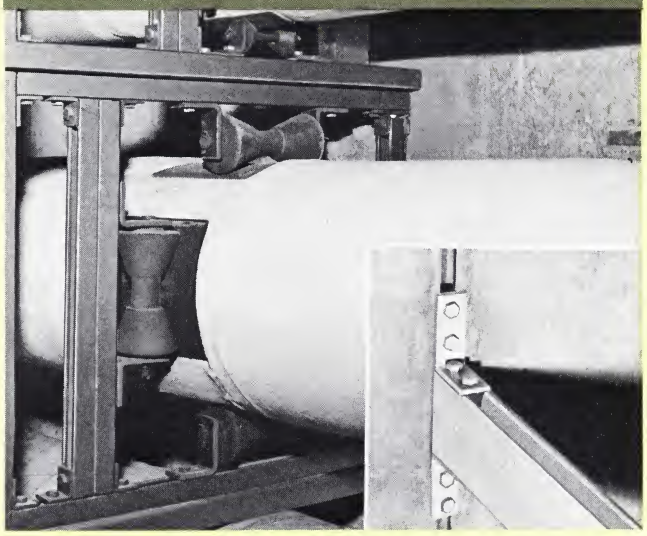
Punch-out Channels have 9/16" diameter holes on 1 7/8" centers starting 15/16" from end. To specify, add suffix "PO" to product number.

Slotted Channels have 13/32"x3" slots on 4" centers starting 2" from end. To specify, add suffix "SL" to product number.

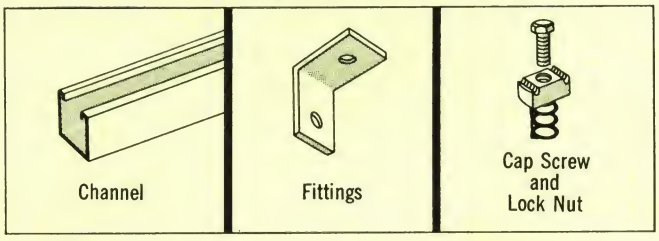
Continuous Concrete Inserts, attached to the pouring face of forms, provide a permanent, continuous mounting slot flush with the concrete surface. A punched portion of the channel back provides protruding "ears" to establish mechanical anchorage in the concrete. A plate fills the void created by the "ear" opening and two 3/16" knock-outs in the plate permit screwing or nailing to steel or wooden forms.

Before the insert is mounted, G-5801 closure tape should be used to seal the continuous slot (available, applied, when specified). This will prevent concrete seepage during pouring, and is easily removed after forms are stripped. The continuous slot, flush with the surface, is then available—in ceilings for hanger rods, in walls or tunnels for racks to carry piping or electrical equipment, and in floors for anchorage.

G-525 Concrete Inserts are made from G-5812 Channel; G-325 from G-3812; G-125 from G-1012; G-155 from G-1315 (see data on page 2 for basic cross section sizes). Basic lengths are 20', 16', 10', or 8' depending on series desired. Spot anchor inserts are also available.



Channel Framing (left) Concrete Inserts (right)



channel finishes

1. Hot dip mill galvanized in accordance with ASTM Designation A-525.

2. Hot dip galvanized after fabrication in accordance with ASTM Designation A-386.

3. Painted with Globe-Green Finish after thorough cleaning and coating with phosphate crystals to assure bonding of paint.

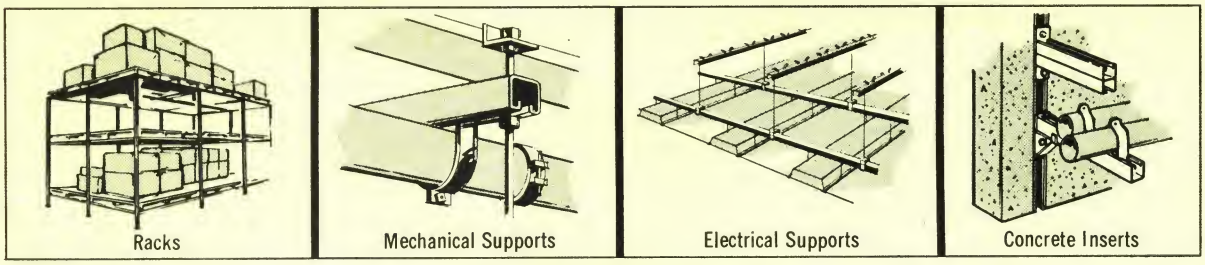
4. Plain, with no coating except preservation oil.

fittings

General fittings for all types of applications are made of 1/4"x1 5/8" hot rolled steel pickled and oiled. Holes are 9/16" diameter, 13/16" from the ends, and 1 7/8" on centers unless otherwise specified. Standard finish is electro-galvanized after fabrication.

The basic flat plate or angle fitting is designed for use with normal mechanical connections. Special fittings for supporting fluorescent fixtures and channel raceways are available.

GLOBE-STRUT Channel Framing is approved by Underwriters' Laboratories, Inc. for use as a continuous metal raceway. Consult UL publications for specific ratings and permitted wire sizes.



A.I.A. File No. 15-L

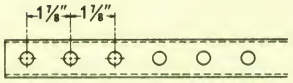
*Reg. U.S. Pat. Off.

GLOBE-STRUT Channel Framing

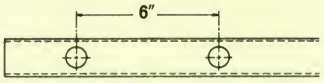
av 98

product data

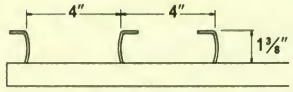
typical cross section



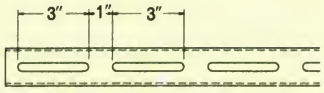
punch-out—web view



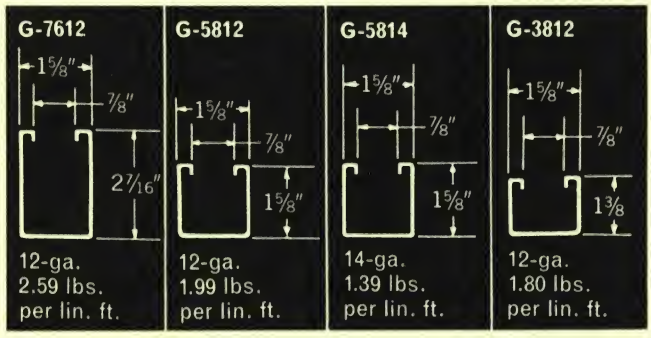
knock-out channel—web view



concrete insert—side view



slotted channel—web view



For beam load data, consult the current Globe catalog or your Globe Division representative.

specifications

channel framing

All channel framing shall be GLOBE-STRUT, as manufactured by the Globe Division of United States Gypsum Company.

The GLOBE-STRUT straight sections shall be cold roll formed from mild steel. The finish shall be (hot dip mill galvanized in accordance with ASTM Designation A-525) (hot dip galvanized after fabrication in accordance with ASTM Designation A-386) painted with Globe-Green after a thorough cleaning and coating with phosphate crystals to assure bonding of paint) (plain, without any coating except preservative oil).

The size of the straight sections shall be as follows:

desig-nation	cross section	length	gauge
G-7612	2 1/16"x1⅝"	20'&10'(+⅜") (cut to length)	#12
G-5812	1⅝"x1⅝"	20'&10'(+⅜") (cut to length)	#12
G-5814	1⅝"x1⅝"	20'&10'(+⅜") (cut to length)	#14
G-3812	1⅜"x1⅝"	20'&10'(+⅜") (cut to length)	#12
G-1012	1"x1⅝"	20'&10'(+⅜") (cut to length)	#12
G-1315	13/16"x1⅝"	20'&10'(+⅜") (cut to length)	#15
G-1619	13/16"x13/16"	16'&8' (+⅜") (cut to length)	#19
G-3219	13/32"x13/16"	10' (+⅜") (cut to length)	#19

The tolerance on all lengths shall be +¼"—0"

Fittings shall be GLOBE-STRUT fittings and shall be as described in the GLOBE-STRUT Catalog or the latest improvements in the GLOBE-STRUT line. The finish shall be (electro-galvanized) (hot dip galvanized in accordance with ASTM Designation A-386) (plain, without any coating except preservation oil).

Lock nuts shall be GLOBE-STRUT lock nuts. They shall be manufactured of hot rolled steel, cyanide hardened and electro-plated with zinc or cadmium. They shall be furnished (with or without) springs.

Bolts shall be GLOBE-STRUT (Hex-Head Cap Screws) (Flat Head Machine Screws) (Round Head Machine Screws). The finish shall be electro-plated with zinc or cadmium.

GLOBE-STRUT Channel Framing is available through distributors in principal cities. Consult your Globe Division representative for information, or write directly to: Globe Division, United States Gypsum Company, 101 So. Wacker Dr., Chicago, Ill. 60606.

CABLE STRUT* Cable Trays

av 99

A.I.A File No. 31-C-74

description and utility

CABLE STRUT Tray Systems are proven members of the United States Gypsum product family. Designed and manufactured by Globe Division to exacting USG standards, they serve in many places and many ways throughout industry.

CABLE STRUT Cable Tray, available in three interchangeable types, is a continuous mechanical support system designed for installation of control, power, and signal conductors or other electrical services. It is made in straight sections, with matching fittings to accommodate all changes of direction or quantity of cables. Design conforms to NEMA recommendations for ventilated cable trays.

These cable trays will also support metal, glass and plastic pipes used in chemical processing, hydraulic lines, and various other industrial equipment. Trays may be supported by GLOBE-STRUT* Channel Framing (see USG Folder AV-98 for suggested support system).

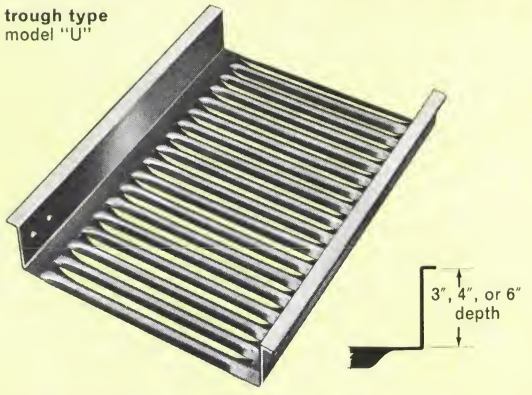
types and functions

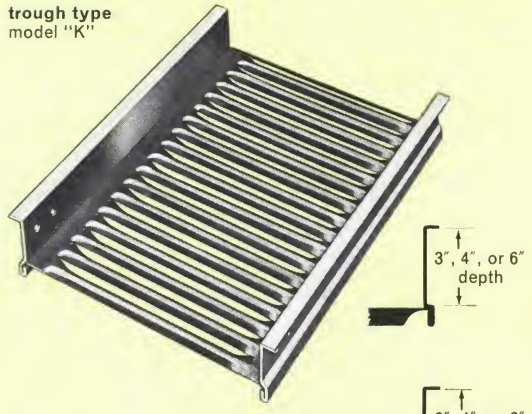
Ladder Type—CABLE STRUT Ladder Type Tray, Model K, is fabricated with two longitudinal side rails connected by individual transverse rung members. Standard clear inside widths: 6″, 9″, 12″, 18″, 24″, 30″ and 36″; depth: 3″, 4″ and 6″; rung spacing: 6″, 9″, 12″ (and 18″, steel only).

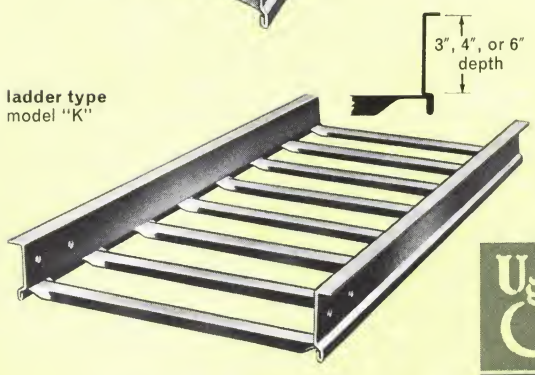
Trough Type—CABLE STRUT Trough Type Trays are available in two models: Model U is of one-piece metal construction with ventilated bottom; Model K is fabricated with two longitudinal side rails. The vented tray transverse rungs are 1″ o.c. with 7/16″ opening. Standard clear inside widths: 6″, 9″, 12″, 18″, 24″ and 30″; depth: 3″, 4″ and 6″. These troughs are generally recommended to prevent festooning of light cables.

Solid Bottom Type—CABLE STRUT Solid Bottom Trays are available in Model U. Widths and depths are same as Trough Type Tray, Model U.

Channel Type—CABLE STRUT Channel Type Tray, Model U, is identical to the trough type but generally is used as a branch type feeder. Standard clear inside widths: 3″ and 4″; depth: 3″.







materials

Steel—steel used is of commercial quality, with a standard finish of galvanized coating conforming to ASTM A-525. Also available hot dipped galvanized after fabrication.

Aluminum—aluminum alloys used are selected for appropriate structural and mechanical properties.

fittings

One series of fittings, standardized to serve both trough and ladder installations, provides economy.

cable tray covers

Cable tray covers, solid or ventilated, are available for all straight sections. Solid covers are available for all fittings. Standard material is commercial quality steel, mill galvanized in accordance with ASTM A-525, and/or aluminum.

miscellaneous accessories

Cable clamps, hangers, hold down or cover clamps, tray divider strips with or without protectors, drill jigs, etc., are available as normal accessories.

Cable pulleys, cable rollers, etc., needed for installation of cable are available for purchase or rent.

safe uniform load

Consult current Globe Division literature for applicable safe uniform loads of various types of cable trays.

*Reg. U.S. Pat. Off.

A.I.A File No. 31-C-74

specifications

general

All cable tray continuous rigid cable support (CRCS) system shall be CABLE STRUT (ladder) (trough) (channel) type construction; (aluminum) (AISI C-1008 steel, hot-dip mill galvanized according to ASTM A-525) (AISI C-1008 steel, hot-dip galvanized after fabrication according to ASTM A-386); manufactured and tested in compliance with currently published NEMA (National Electrical Manufacturers Association) Cable Tray Standards VE-1. Trough and ladder types to be interchangeable.

mechanical properties

Straight sections shall be capable of supporting a cable load of — lbs. per lin. ft. on a — ft. simple span between supports [*where applicable*, NEMA Class (I), (II) tray] where connectors are located within ¼ point of the span of tray.

When fittings are supported to minimum standards outlined in NEMA Standard VE 1-1965 on ventilated cable tray, but with no span between supports exceeding that used for adjacent straight sections, the fittings shall be capable of supporting the same design load as straight sections.

Short time total loads on straight sections or fittings shall not exceed design load by more than one-third.

physical dimensions

The cable tray shall have a clear inside width, with top flanges turned out, of (3″) (4″) *channel only*; (6″) (9″) (12″) (18″) (24″) (30″) *trough, ladder or solid bottom type;* (36″) *ladder type only;* (3″) (4″) (6″) clear inside depth, and have rung spacing of (6″) (9″) (12″) (18″) *ladder type only.*

Fittings shall have rung spacing not to exceed 4 inches at maximum opening measured in a direction parallel to the cable for either trough or ladder type tray.

Fittings, both vertical and horizontal, shall have (8″) (12″) (24″) (36)″ minimum radius.

electrical properties

Resistance between cable tray sections and fittings shall be less than .00033 ohms. All fastener heads inside tray shall be button-head design. All expansion or adjustable splices shall be equipped with a jumper cable.

Cable tray system shall be grounded in conformance with National Electrical Code, Section 250-33; however, in accordance with the NEC, Article 318, the CRCS system shall not be used either as a grounded circuit conductor or as an equipment grounding conductor.

The cable tray system shall be installed to conform to the requirements of NEC, Article 318.

covers and accessories

Covers and accessories supplied by the manufacturer shall be installed where indicated on the drawings. Solid bottom type tray section bottoms shall be aligned with "H" bars.

supports

Supports shall be in conformance with NEMA Standards and recommendations. Supports shall be capable of carrying required cable loads plus tray weight and any additional short time total loads not to exceed the design loads by more than one-third.

On vertical tray runs cable shall be held against thrust by supports external to tray.

manufacturer

Cable tray shall be as manufactured by Globe Division, United States Gypsum Company, 101 S. Wacker Dr., Chicago, Ill. 60606.

CABLE STRUT Cable Tray Systems are available through distributors in principal cities. Consult your Globe Division representative for information, or write directly to: Globe Division, United States Gypsum Company, 101 So. Wacker Dr., Chicago, Ill. 60606.